Flow control techniques

Pneumatic solenoid valves may be subdivided into two categories: digital on/off solenoid valves and proportional solenoid valves.
Digital solenoid valves combine their open-closed position with an electric on-off control.
Proportional solenoid valves combine a particular position (between open and closed) in a proportional way with a tension or variable-current control device. The evolution of technology led to the development of new flow control techniques, which allow the use of digital components instead of proportional ones. These techniques, started from electronics, are PWM, PFM, PNM and PCM, besides combinations between them (Combined Techniques).

PWM Technique

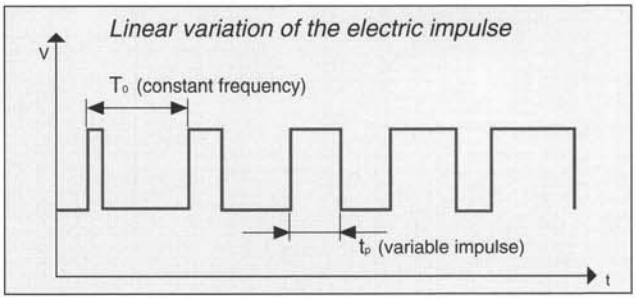
PWM (Pulse Width Modulation) technique consists of the generation of a square wave of constant frequency, with variable pulse duration. The DC (duty-cycle) defined as the rate between the duration of t_p signal (which is variable) and T_o period (which is constant), expressed in percentages, is indicated as:

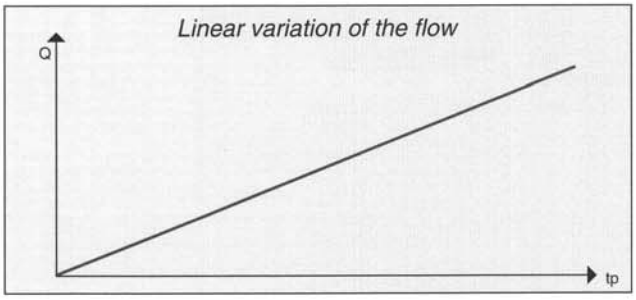
$$DC = t_p / T_o \times 100$$

A linear growth of the DC (duty-cycle) corresponds to a linear growth of the impulse duration. It means that a PWM control to a 2/2 normally closed (NC) solenoid valve implies a proportional variation of the passing flow, which results to be:

$$Q = Q_{nom} \times t_p / T_o$$

where t_p is variable, Q is the passing flow and Q_{nom} is the rated (maximum) flow. The flow may assume infinite values included between zero and maximum flow.





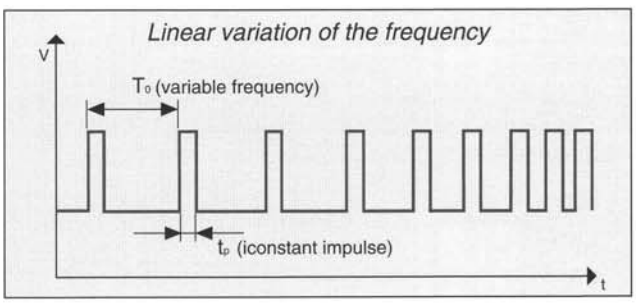
Solenoid Valves 820 - 850 - 720 (2/2) - 750 (2/2) Series

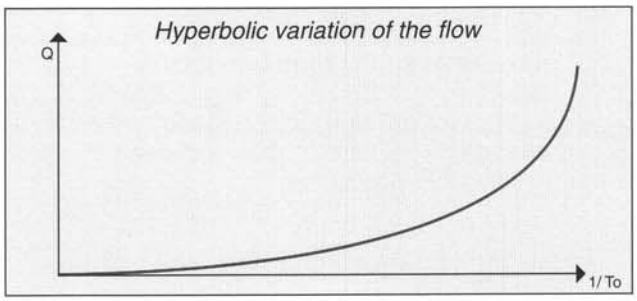
PFM Technique

PFM (Pulse Frequency Modulation) technique consists of the generation of a variable-frequency (period) square wave, with a constant impulse duration. A PFM control to a 2/2 NC solenoid valve implies a proportional variation of the maximum passing flow to frequency, i.e. in inverse proportion to T_o period:

$$Q = Q_{nom} \times t_p / T_o$$

where the period T_o is variable. The flow may assume infinite values included between zero and maximum flow.





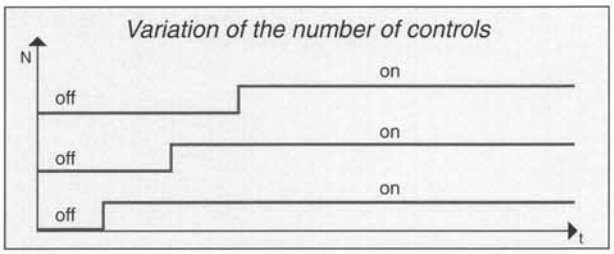
Solenoid Valves 820 - 850 - 720 (2/2) - 750 (2/2) Series

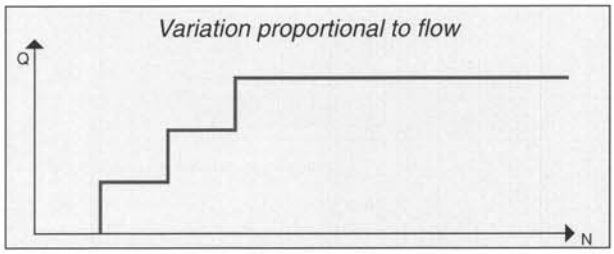
PNM Technique

PNM (Pulse Number Modulation) technique is based on the features of multiple shutter valves of 750 and 850 Series. It consists of the generation of on-off control groups. This means that a PNM control (variable from 0 to n), applied to an n shutter group of equal flow, implies a proportional variation to n of the passing flow. The flow results as:

$$Q = Q_n \times n$$

where Q_n is the rate of flow of only a shutter. The rate of flow may assume n values included between zero flow and maximum flow. When n = 8 the achievable values are just 8.





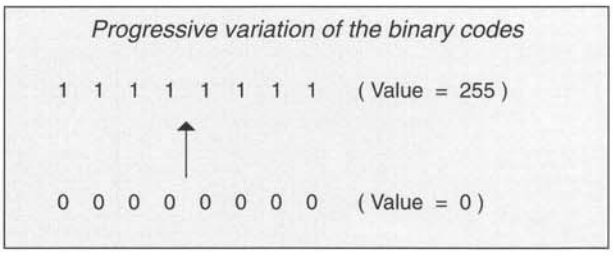
Solenoid Valves 850 - 750 (2/2) Series

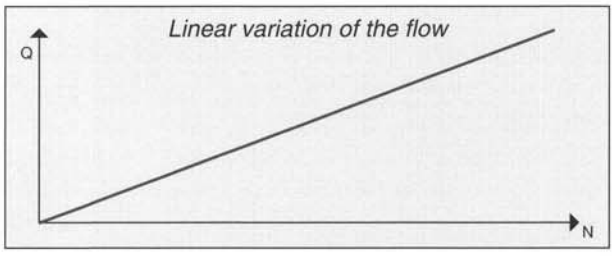
PCM Technique

PCM (Pulse Code Modulation) is based on the features of the multiple shutter valves of 850 PCM Series. It resumes the principles of binary codification, typical of computers, and it consists of generating on/off control groups with shutters having different flows. This means that a PCM control of binary type (variable from 0 to n) to a group of n shutters NC 2/2 having different flow, which is determined according to 2 (SV 1=1; SV2=2; SV3=4; SV4=8...; SV8=128) implies a variation of the passing flow proportional to n. The flow results to be the summation:

$$Q = \sum_n (Q_n)$$

Where Q_n is the flow of the solenoid valve n and n is expressed in a binary way. The flow may assume 2^n values, included between zero flow and maximum flow. Consequently, in the n = 8 case, the assumable values are 256.



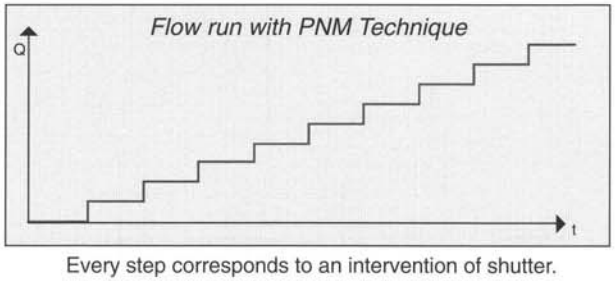


Solenoid Valves 850 PCM Series

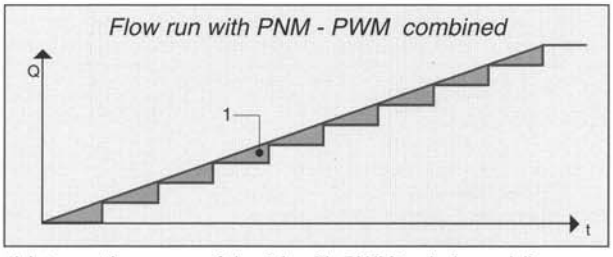
Combined Techniques

The employment of combined techniques may usefully result in joining the features of the single techniques, which have been previously illustrated. The resulting combinations allow a greater level of accuracy in the flow control. The following example displays the advantages of the combined techniques employed on a solenoid valve having multiple shutters.

Kind of control: fine regulation of the flow on multiple shutter solenoid valves
Type of valve: MX 851.900 (1 outlet - 9 independent shutters)
Employed techniques: 8 shutters controlled with PNM technique - 1 shutter controlled with PWM technique



Every step corresponds to an intervention of shutter.
A proportional variation of the flow is obtained.

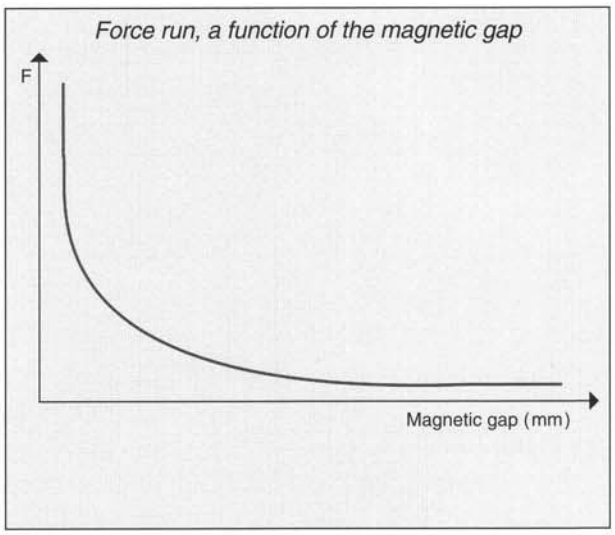


1) Intervention areas of the 9th with PWM technique. A linear variation shutter controlled is obtained.

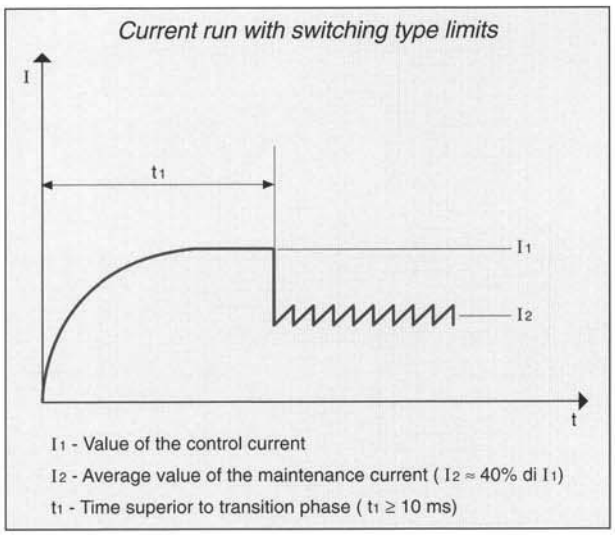
Solenoid Valve 850 - 750 (2/2) Series

ON - OFF control Technique with double level of tension

One of the peculiar characteristics of Matrix technology is the exponential increment of the energy efficiency as regards the magnetic system during either the opening phase (NC, Function) or closing phase (NO, Normally Open, Function) of the solenoid valve (Picture 1). Said characteristics derive from the progressive reduction of the magnetic gap, reaching zero-value when the solenoid valve is completely open (NC Function) or completely closed (NO Function) (See Picture 3 at "Matrix technology" paragraph).



Picture 1



Picture 2

Therefore, the maintenance of the open (or closed) solenoid valve condition requires a considerably lower energy level, compared with the transition phase, during which the change of condition takes place. Said transition phase coincides with the response time of the solenoid valve. Therefore, after this period of time is possible to restrict the dissipated power, reducing the control tension or the relative current (for example from 24 VDC to 14 VDC).

The incidence of said reduction of the dissipated power by the solenoid valve, in the typical case of 750.....JJ, Series is the following:

Dissipated power with 24 VDC tension (single coil)	1.9 W
Dissipated power with 14 VDC tension (single coil)	0.65 W

The reduction of the control tension may be realized through the hardware (see tension reductor PRB in chapter "Electronic Driver Boards"). In this case, the circuit occurs when the control time is higher than 100 ms, inserting a resistance in series with the coil of the solenoid valve. Therefore, there is a reduction of the feeding tension. The maximum operation frequency of the solenoid valve, using the PRB circuit is limited to 20 Hz. The reduction of the relative current may be realized through the ON-OFF control at high frequency (it is typical at 20 KHz), named Switching, and through a suitable duty-cycle (Picture 2).

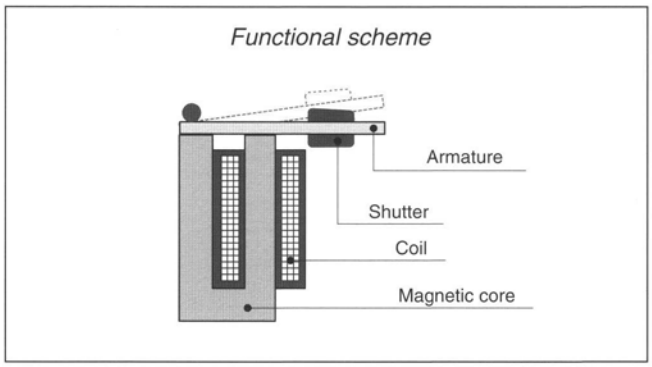
This kind of current reduction with switching control is present in the Universal Driver Board with 8-channel UDB (see "Electronic Driver Boards").

The advantages coming from this control technique are particularly evident in the case of solenoid valves used with high duty-cycles and high ambient temperature. The reduced absorption, and the consequent low power, dissipated by the solenoid valve drastically reduce the working temperature of the elastomers. In this way, from a dynamic point of view, the ideal working conditions are assured.
Moreover, said control technique assures a remarkable energy saving, particularly evident in the case of multiple applications.

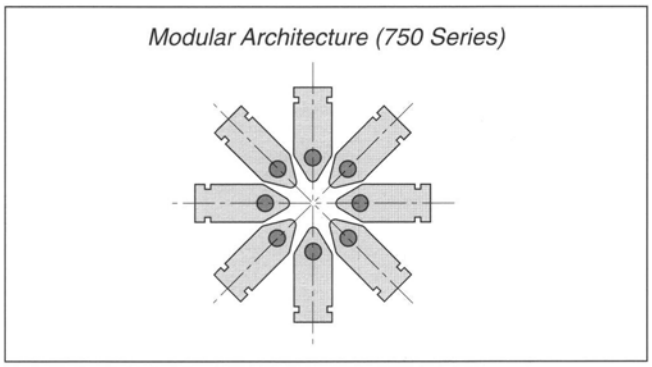
Matrix Technology

Matrix pneumatic technology uses two highly innovative principles:

- the absence of internal friction during the shutter opening and closing phases;
- the modular architecture, allowing the assembly of several shutters in a sole body.



Picture 3

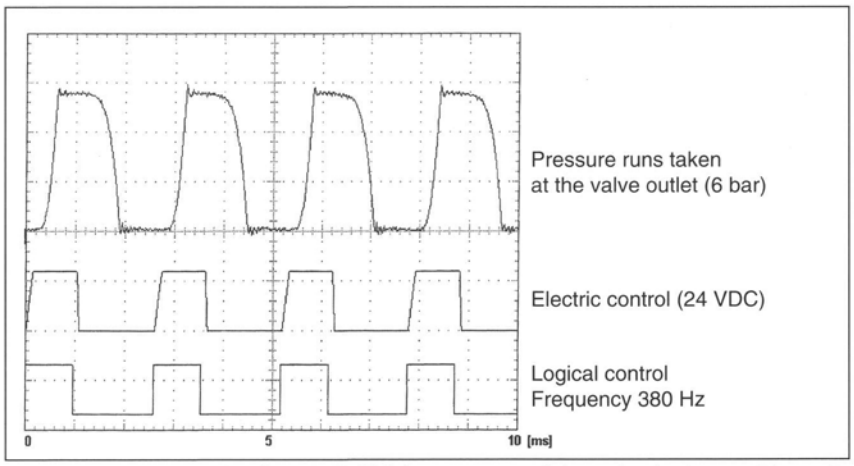


Picture 4

The traditional technologies, employed in solenoid valves, both slide and shuttered valves, suffer in different ways, because of the inertial forces of their mechanical components, thermal exchanges, trimmings frictions, high temperatures, caused by the electric windings.

The absence of friction (Picture 3), combined with the reduction of the moving mass, as well as the employment of material with energetic high efficiency gives the pneumatic control extremely fast response times and increased precision and repetitiveness. A remarkable economy in work (energy absorption and compressed air use), high reliability and product life superior to 500 million cycles per each single shutter. Further, remarkable advantages, assured by Matrix technology are a high insensibility to ranges of temperature (ambient temperature) and to vibrations and accelerations.

Working characteristics are connected with the type of control, which, as shown in the chapter "Speed-up control Techniques", determines the response times. Solenoid valves, in standard version, i.e. equipped with traditional on/off control, have a response time better than five ms on opening, and better than two ms on closing (full frequency of working 200 Hz). On the contrary, speed-up controlled solenoid valves have a response time both on opening and on closing better than 1 ms, with a maximum frequency of working of 500 Hz. Their increase (phase displacement) and reduction as regards the control are insignificant (Picture 5).



Picture 5 - MX 821. The plot effected with high-frequency control shows the absolute precision and repetitiveness of the pneumatic signal together with its perfect coincidence with the electric signal.

Among the newest techniques of high-, low frequency control, such as PWM and PFM techniques, the former prevails for a number of reasons. In fact, this technique is easier to implement in hardware and software ways. Generating a square wave at constant frequency and with a variable signal is indeed a very simple operation. The PWM technique is linear for system controls; it is easy to manage through both the electronics and the programmable controls. It is adaptable to a great number of systems; it is a well-known technique, widely spread also in the electronic field. For example, all switching feeders function with PWM technique. Besides, the PWM control of a digital solenoid valve transforms it into a solenoid valve proportional in flow, only by changing the pulse duration.

Since the higher are readiness and precision of a system, the higher results the control speed (frequency). Consequently, the PWM control technique requires unusual technical features for the elements to be controlled. Just like computers, where their global speed is due to the operating rate (frequency) of the interior clock. Namely, said technical features are characterized by:

- extremely reduced response times;
- very long operation life;
- insensibility to work at high speed.

The importance of the response times is fundamental. Actually, a short response time allows to obtain very 'steep' rising and fall fronts, similar to a logic drive given by the control, without any phase lag. Moreover, it is then possible to work at high or low speed (frequency) and in advance to determine the effective flow rates produced by the control. In this case, the solenoid valve may be considered as a logic element with immediate commutation. The response time determines also the exploitation percentage of the duty-cycle: short response times allow utilizing practically all the range of duty-cycle, for example 5 to 100%. On the contrary, long response times, the period being equal, allow using short ranges of duty-cycles. Therefore, the period being equal also in that case, a larger modulation capacity and, in the case of control application, an action of greater precision and speed are derived.

The modular architecture (picture 4), i.e. the second important innovation offered by Matrix technology, allows a surprising variety of new applicative solutions, comprising the new techniques of flow control like PNM, PCM and combined flow control techniques. All the multiple solenoid valves (850 and 750 Series) are modular. They are equipped with (single or assembled) electrical controls and at the outlets (single or assembled), through the interchangeable interface flanges with either 1-3-9 outlets (850 Series) or 1-2-4-8 outlets (750 Series). When the response times are equal, the variation of the flow rate is proportional. Furthermore, in the multiple solenoid valves the pneumatic feeding (supply) and outlet are conveyed. In this way, they may be assembled on manifolds and, consequently, the plants may be simplified and rationalized.

Therefore, 850 Series is characterized by models having 1, 3, 9 electrical controls, likewise 750 Series is characterized by models equipped with 1, 2, 4, 8 electrical controls.
The combination between the number of electrical controls and the number of outlets generates a wide range of applicative variants, some application examples of which are here supplied:

- 850 2/2 Series, 1 outlet - 9 controls version
Variable flow path section; flow rate proportional to the number of controls; nine flow rate levels.

- 850 2/2 Series, 1 outlet - 1 control version
High flow rate (to 1600Nl/min at 6 bar rel.); response times lower than 1 ms in speed-up versions; actuation speed higher than 500 Hz.

- 750 3/2 Series, 8 outlets - 8 controls version
Eight 3/2-solenoid valves, integrated in a single body of reduced size, separately controlled.

- 750 5/2 Series, 8 outlets - 4 controls version
Allows to control separately four double acting cylinders.

- 750 2/2 - 3/3 Series, multifunction, 4 outlets 2/2 NC - 8 controls version
Allows the control of four single acting cylinders as well as the control with PWM pressure technique in two pneumatic chambers with automatic system draining.

- 750 3/3 Series, closed centres, 4 outlets 2/2 NC and NO - 8 controls version
Allows the pressure control inside four pneumatic rooms, managing the system filling, maintenance, and draining functions.

In short, it appears evident the innovative aspect of the modular architecture, which allows to settle, in an only small-sized volume, an almost limitless range of integrated pneumatic functions.

TECHNICAL INFORMATION

Rules for use not in accordance with the instructions

The general characteristics of all models and their condition of use are referred to in the catalogue pages. When a correct condition of use may be guaranteed, it is necessary to follow the undermentioned instructions. The non-observance of said instructions may generate a quick decay of the original characteristics of the product or irreversible damages, which may compromise the its correct working.

1. Use of non stabilized tensions (except speed-up models)

Tension valves higher than limits, indicated in the use conditions may generate damages to elastomers and coils. In such a case you must provide for the following protections:

a) Tension stabilizer;
b) Step-down transformer circuit (PRB);
c) Control circuit with double tension level.

2. Use with ambient high-temperature

An environmental high-temperature (over 50°C), combined with long actuation times and without an air passing may generate damage to both elastomers and coils. In such a case you must provide as follows:

a) Assure the solenoid valve of a suitable ventilation;
b) Install a tension reducer circuit (PRB) or make use of a control circuit with double tension level (except the speed-up model).

3. Continuous actuation (ED 100% models)

According to the models, said use, particularly when it is combined with such conditions as in 1 and 2, may generate damages both to elastomers and coils. In such a case you must provide as follows:

a) Avoid to install the solenoid valve near a heat source;
b) Assure the solenoid valve of a suitable ventilation;
c) Install a tension reducer circuit (PRB) or use a control circuit with a double tension level (except the speed-on models).

4. Use of non in accordance fluid

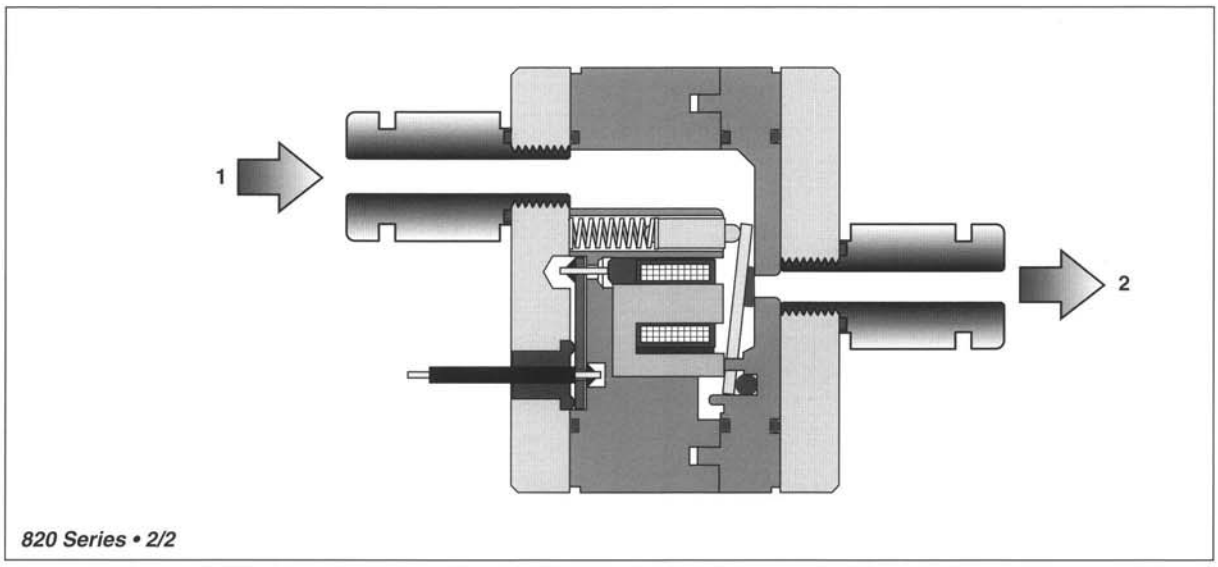
Matrix solenoid valves require no lubrication. The insert in the solenoid valve of lubricating grease and oil may produce a decay of the functional features. Lubricating oils combined with liquid paraffin, solvents or some other chemical products may alter both conformation and functionality of the elastomers, provoking flow rate reductions and cutting the actuation times. It is recommended to assure a suitable drying system and fluid filtering, and avoids the introduction in the pneumatic circuit of lubricants and agents non compatible with NBR (Nitrile-butadiene rubber) introduction in the pneumatic circuit.

5. Use of conic fittings and/or dopes

It is recommended, when the solenoid valve is not provided with it, the use of conic fittings, equipped with cylindrical thread, provided with 0-Rings or washers. The use of conic fittings and/or dopes may compromise the correct working of the solenoid valve.
When it is not possible to assure a suitable protection level, it is recommended to use models equipped with a HNBR actuators, available in the 860, 720 and 750 Series.

SOLENOID VALVES 820 SERIES • 2/2

The Pneumatic Solenoid Valves 820 Series are NC 2/2 type.
The research about materials and new technological solutions allowed the realization of a shutter solenoid valve with an extremely simple operation principle and with avant-garde dynamic characteristics. The mass of the moving elements has been reduced to the minimum and every inner friction has been eliminated: in this way, we obtained response times of milliseconds and an operation life over 500 million cycles. Due to the possibility of controls of speed-up type, their dynamic characteristics are even more improved. Standard solenoid valves with 24 VDC control have a response time lower than 5 ms in opening and 2 ms in closing, with a maximum operation frequency of 200 Hz. On the contrary, solenoid valves with speed-up control have a response time lower than 1 ms, both in opening and in closing, with a maximum operation frequency of 500 Hz.
Besides high-speed characteristics, solenoid valves 820 Series offer flow rate values up to 180ℓ/minute (ANR), with feeding pressure from 0 to 8 bar.
Controlling the valve through either PWM (Pulse Width Modulation) or PFM (Pulse Frequency Modulation) technique, it is possible to vary the passing flow rate and to obtain, in this way, a solenoid valve, having a proportional flow rate.
820 Series is available both in-line assembly and sub-plate version, equipped with such accessories as multi-position manifolds or speed-up driver boards.



820 Series • 2/2

Advantages

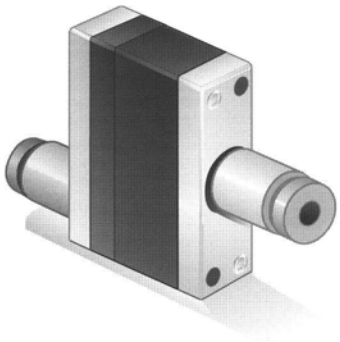
- Compact dimension.
- High duct diameter and flow rate.
- Short response times.
- Insensitivity to frequency work and to vibrations.
- Low absorbed power.
- Precision, repetitiveness and flexibility.
- Long operating life.

Applications

- Process and precision instrumentation.
- Pressure and flow rate control devices.
- Positioning systems.
- Selection systems.
- Metering systems.
- Biomedical and measure sector.

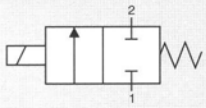
Materials

- Body in PPS.
- Flanges in Al.
- Seals in NBR.



CONTROL:	DIRECT	PFM	PWM	

N. 1 NC



GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases(–10 + 50°C)	
FILTRATION RATING	Min 40 micron	
TEMPERATURE	– 10 + 50°C (Standard version)	
RESPONSE TIME IN OPENING	24 < 5 ms	XX / KK < 1 ms
RESPONSE TIME IN CLOSING	24 < 2 ms	XX / KK < 1 ms
MAXIMUM FREQUENCY	200 Hz	500 Hz
WEIGHT	25 g	
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles	
IP RATING	IP 62	

IDENTIFICATION CODE

	M	X	8	2	1	1	0	0	C	2	24

OUTLETS

1	1 Outlet

FUNCTION

C	NC

FLOW RATE (at 6 bar)

M	100 Nl/min
N	140 Nl/min (control tension XX KK)
O	180 Nl/min (control tension XX KK)

TYPE

2	2/2

VERSION

	Body ported
D	Manifold

CONTROL TENSION

24	24 VDC ± 10 %	2.9 W
XX	Speed-up in current (24 VDC)	1.3 W
KK	Speed-up in tension (24 VDC)	0.8 W

No. ELECTRICAL CONTROLS

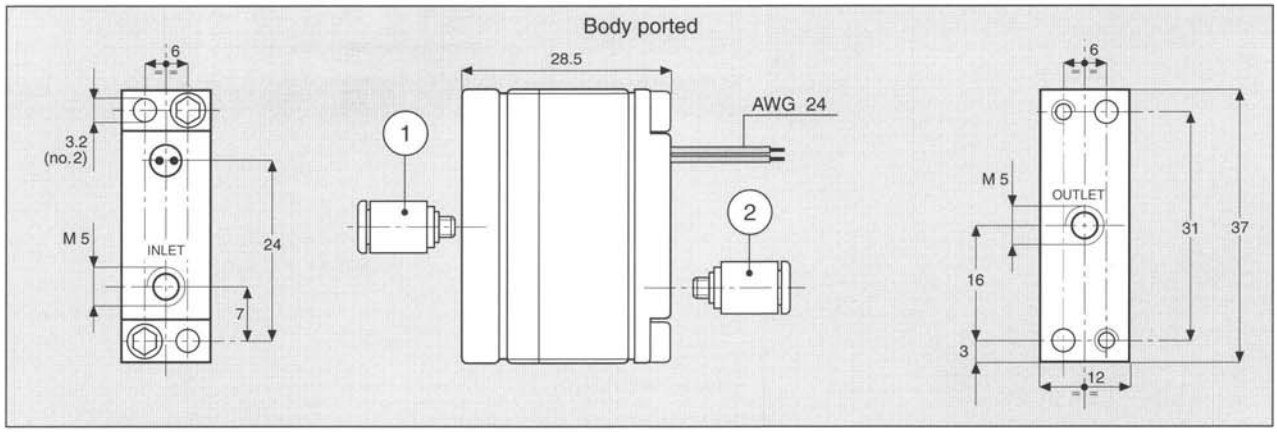
1	1 Control

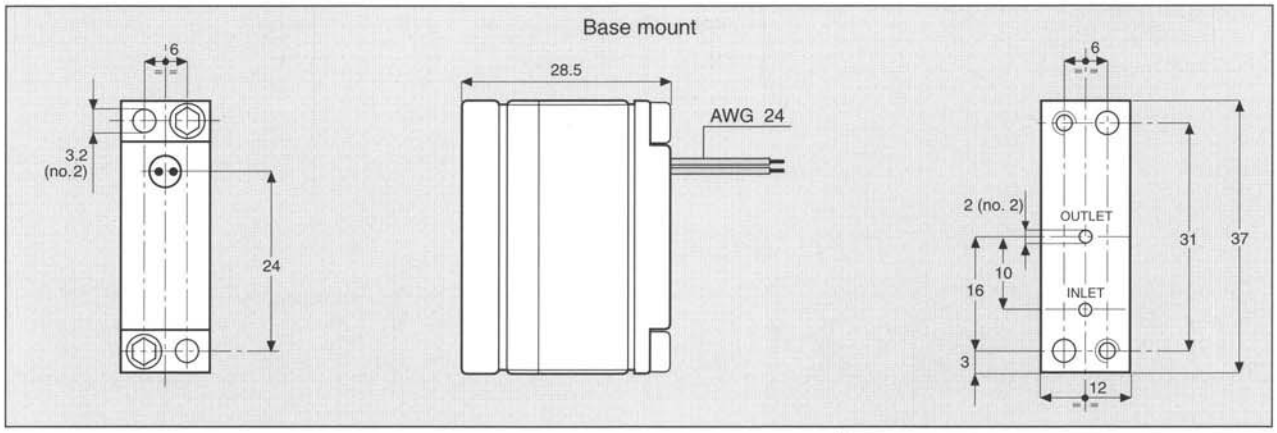
OPERATING PRESSURE

	RANGE	*MODELS*
0	2 - 8 bar	All
3	0 - 8 bar	M ..... XX / KK
4	0 - 6 bar	All

PORT CONNECTION

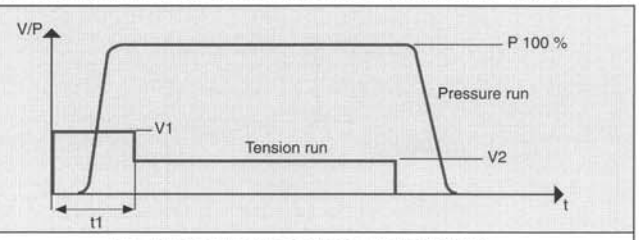
0	Integrated cables IP 62 L = 500 mm
1	Integrated cables IP 62 L = 100 mm





ACCESSORIES		
Reference	*Quantity*	*Description*
1	1	PUSH-IN FITTING Ø 4/6
2	1	PUSH-IN FITTING Ø 4/6
NOTE: Inch size available		

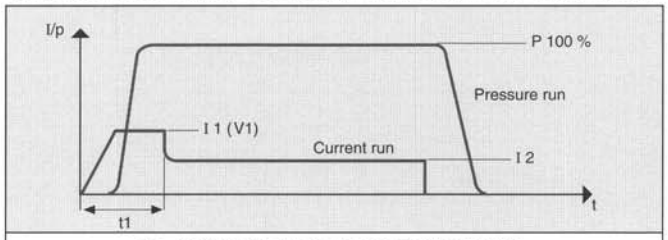
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

M	V 1 = 24 VDC	t 1 = 2.0 ms	V 2 = 5 VDC
N	V 1 = 24 VDC	t 1 = 2.0 ms	V 2 = 5 VDC
O	V 1 = 24 VDC	t 1 = 2.5 ms	V 2 = 5 VDC

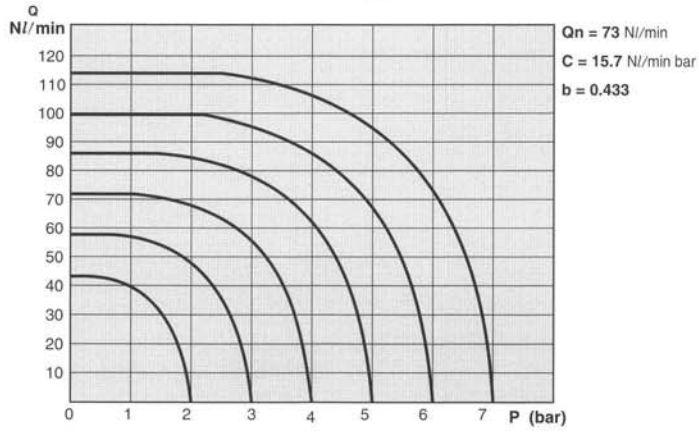
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

M	I 1 = 0.7 A	t 1 = 2 ms	I 2 = 0.3 A
N	I 1 = 0.8 A	t 1 = 2 ms	I 2 = 0.3 A
O	I 1 = 0.9 A	t 1 = 2 ms	I 2 = 0.3 A

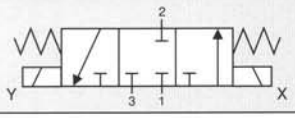
FLOW RATE M



821 CLOSED CENTRE • 3/3 NC

CONTROL:	DIRECT	PFM	PWM	

N. 1 NC



GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)	
FILTRATION RATING	Min 40 micron	
TEMPERATURE	– 10 + 50°C (Standard version)	
RESPONSE TIME IN OPENING	24 < 6 ms	XX / KK < 3 ms
RESPONSE TIME IN CLOSING	24 < 2 ms	XX / KK < 1 ms
MAXIMUM FREQUENCY	100 Hz	200 Hz
WEIGHT	130 g	
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycle	
IP RATING	IP 62	

IDENTIFICATION CODE

G	M	K	8	2	1	2	0	1	C	3	24

OUTLETS

1	1 Outlet

FUNCTION

C	NC

FLOW RATE (at 6 bar)

M	60 Nl/min
N	90 Nl/min (control tension XX KK)
O	120 Nl/min (control tension XX KK)

TYPE

3	3/3

VERSION

G	Body ported

CONTROL TENSION

24	24 VDC ± 10 %	1.9 W
XX	Speed-up in current (24 VDC)	1.3 W
KK	Speed-up in tension (24 VDC)	0.8 W

No. ELECTRICAL CONTROLS

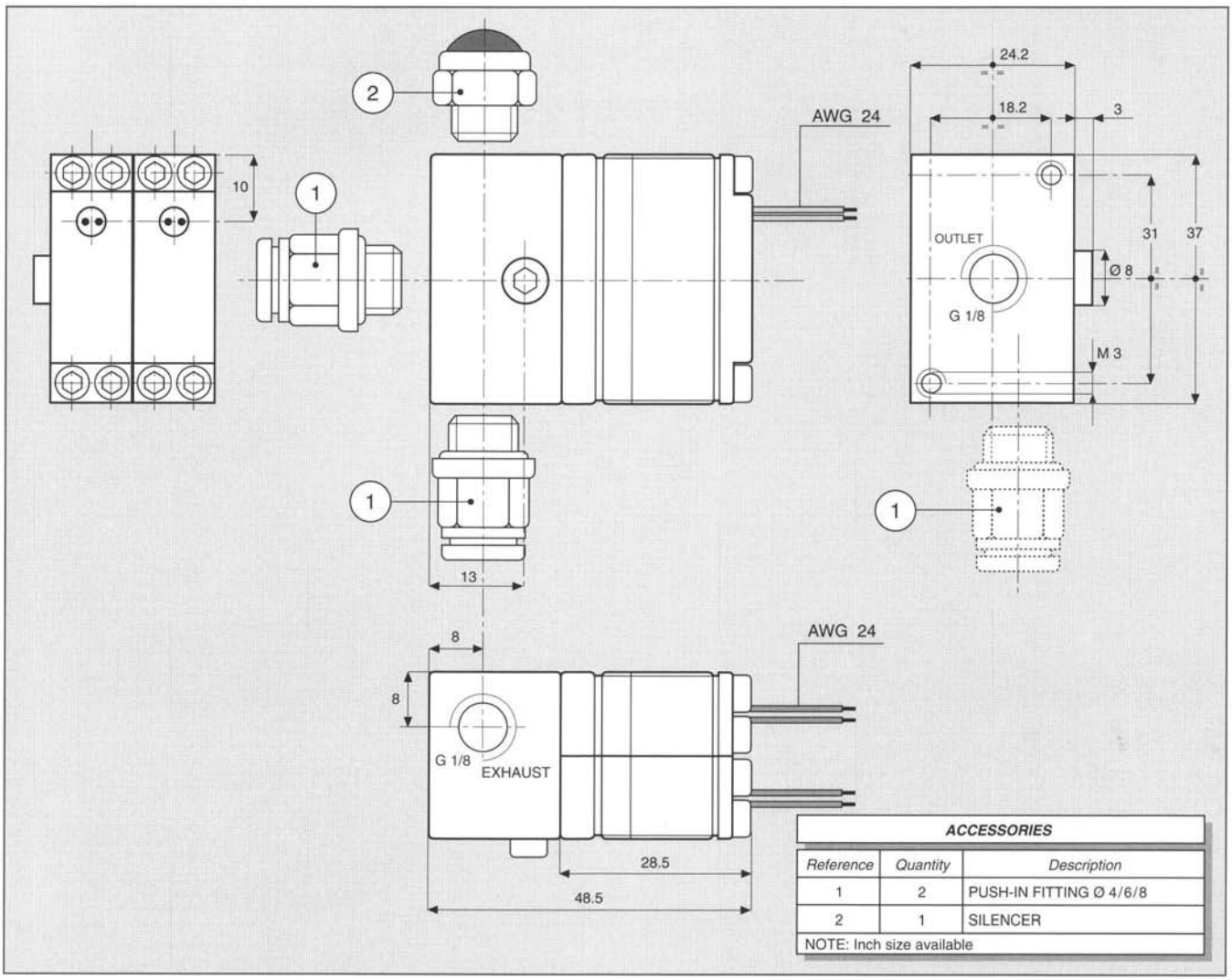
2	2 Controls

OPERATING PRESSURE

	RANGE	*MODELS*
1	0 - 4 bar	All
3	0 - 8 bar	M ..... XX / KK

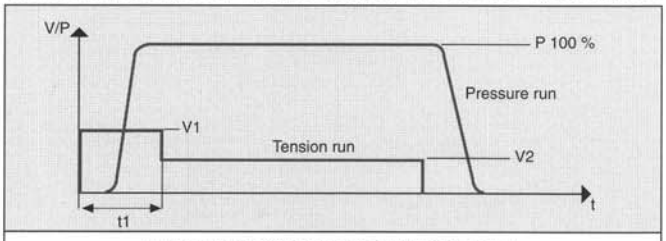
PORT CONNECTION

0	Integrated cables IP 62 L = 500 mm
1	Integrated cables IP 62 L = 100 mm



ACCESSORIES		
Reference	*Quantity*	*Description*
1	2	PUSH-IN FITTING Ø 4/6/8
2	1	SILENCER
NOTE: Inch size available		

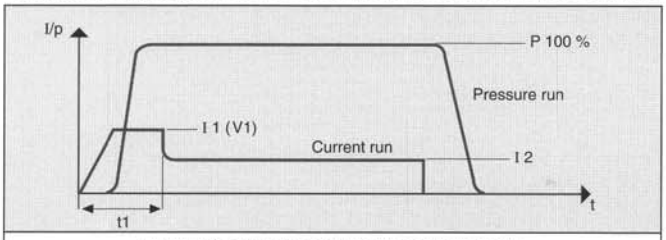
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

M	V 1 = 24 VDC	t 1 = 2.0 ms	V 2 = 5 VDC
N	V 1 = 24 VDC	t 1 = 2.5 ms	V 2 = 5 VDC
O	V 1 = 24 VDC	t 1 = 3.0 ms	V 2 = 5 VDC

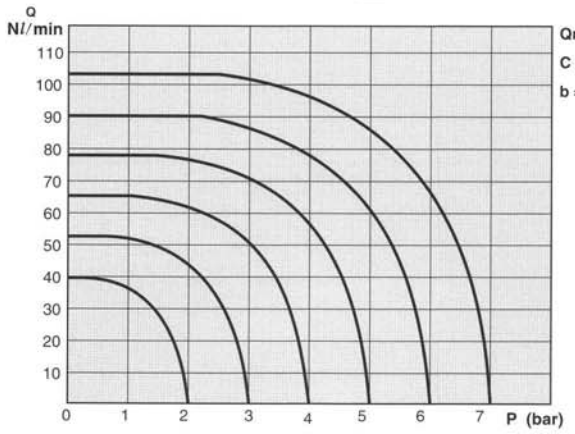
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

M	I 1 = 0.7 A	t 1 = 2 ms	I 2 = 0.3 A
N	I 1 = 0.8 A	t 1 = 2 ms	I 2 = 0.3 A
O	I 1 = 0.9 A	t 1 = 2 ms	I 2 = 0.3 A

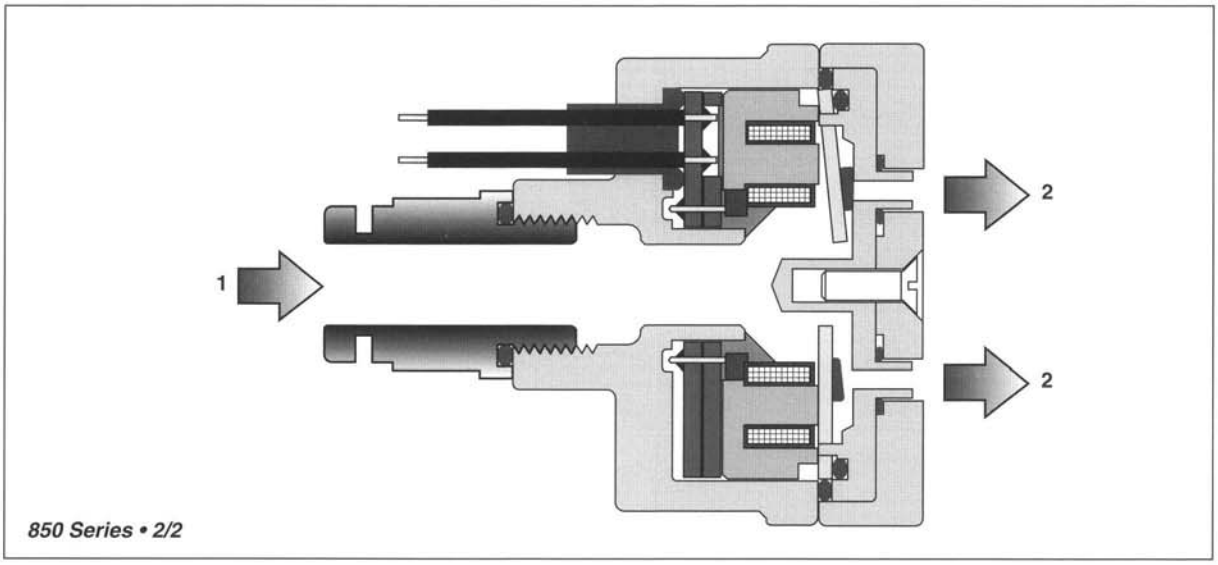
FLOW RATE N



Qn = 73 Nl/min
C = 15.7 Nl/min bar
b = 0.433

SOLENOID VALVES 850 SERIES • 2/2

Pneumatic solenoid valves of 850 Series are of the 2/2 NC type.
Their modularity represents the innovation in this Series. Nine independent shutters with common pneumatic feed and with either separate outlets or assembled outlets in order to increment the flow rate. The response time, in milliseconds, is independent from the flow rate value, and its operative life is over 500 millions cycles.
The Series is fit for step change the flow rate (till nine steps in single outlet version), transforming a simple 2/2 into a solenoid valve, having a proportional flow rate and absolute repeatability. Besides, by combining different control techniques (for example, PWN and PNM) the flow rate may vary in linearity. Due to the availability of controls of speed-up type, dynamic features are even more improved.
Consequently, the response time for standard solenoid valves with 24 VDC control results below 5 ms in opening and below 2 ms in closing, while the maximum operating frequency is 200 Hz. The response time for solenoid valve with speed-up control, both in opening and in closing, is below 1 ms, with a maximum operating frequency of 500 Hz.
Besides high speed features, solenoid valves of 850 Series present flow rate values to 1620 ℓ/minute (ANR), with a supply pressure from 2 to 8 bar.



850 Series • 2/2

Advantages

- Compact dimension.
- High duct diameter and flow rate.
- Short response times.
- Insensitivity to frequency work and to vibration.
- Low absorbed power.
- Precision, repetitiveness and flexibility.
- Long operating life.

Application

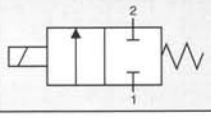
- Pressure and flow rate control devices.
- Positioning systems.
- Selection systems.
- Metering systems.
- Biomedical sector.
- Actuator speed control.

Materials

- Body and flanges in Al.
- Seals in NBR.

CONTROL:	DIRECT	PFM	PNM	PWM

N. 9 NC



GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)	
FILTRATION RATING	Min 40 micron	
TEMPERATURE	– 10 + 50°C (Standard version)	
RESPONSE TIME IN OPENING	24 < 5 ms	XX / KK < 1 ms
RESPONSE TIME IN CLOSING	24 < 2 ms	XX / KK < 1 ms
MAXIMUM FREQUENCY	200 Hz	500 Hz
WEIGHT	160 g	
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles	
IP RATING	IP 62	

IDENTIFICATION CODE

	M	X	8	5	0	9	0	0	C	2	24

OUTLETS

0	9 Outlets without interface

FUNCTION

C	NC

SINGLE OUTLET FLOW RATE (at 6 bar)

M	100 Nl / min
N	140 Nl/min (control tension XX KK)
O	180 Nl/min (control tension XX KK)

TYPE

2	2/2

CONTROL TENSION

24	24 VDC ± 10 %	2.9 W (1)
XX	Speed-up in current (48 VDC)	1.3 W (1)
KK	Speed-up in tension (24 VDC)	0.8 W (1)

(1) Single shutter

No. ELECTRICAL CONTROLS

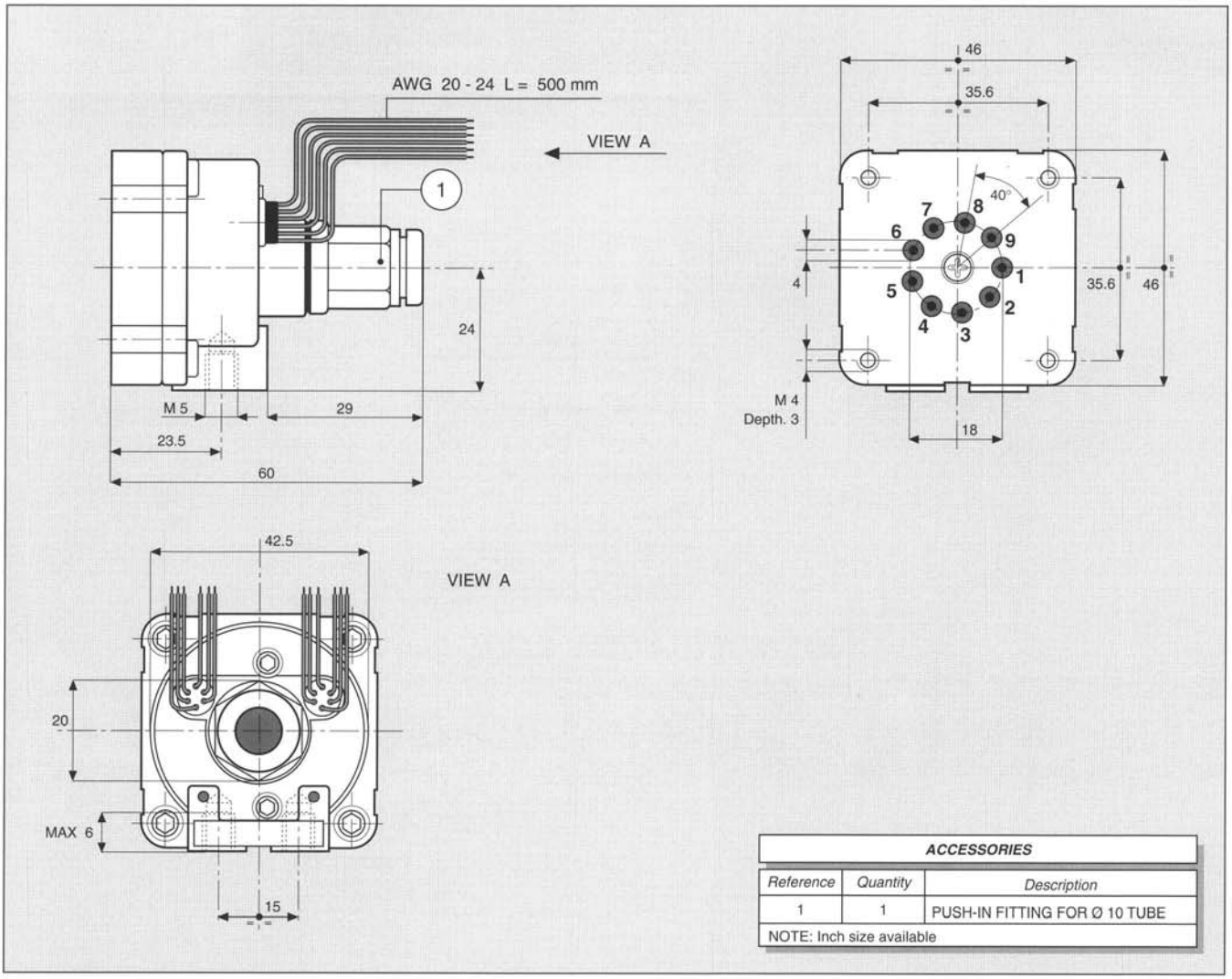
1	1 Control (9 Outlets)
3	3 Controls (3 Outlets)
9	9 Controls (1 Outlet)

OPERATING PRESSURE

	RANGE	*MODELS*
0	2 - 8 bar	All

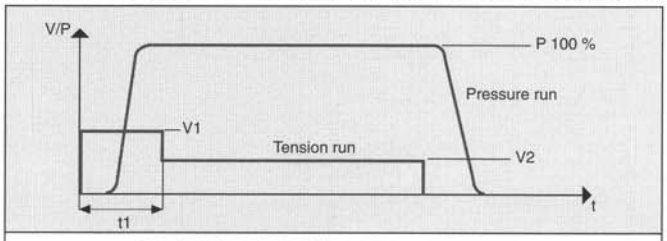
PORT CONNECTION

0	Integrated cables IP 62 L = 500 mm



ACCESSORIES		
Reference	*Quantity*	*Description*
1	1	PUSH-IN FITTING FOR Ø 10 TUBE
NOTE: Inch size available		

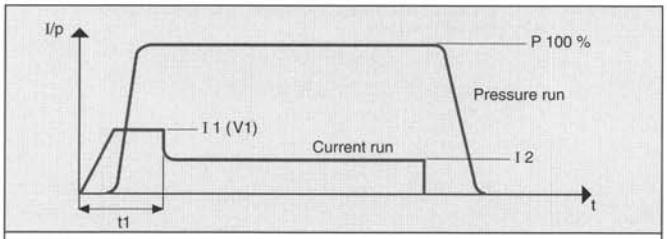
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

M	V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC
N	V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC
O	V 1 = 24 VDC	t 1 = 3 ms	V 2 = 5 VDC

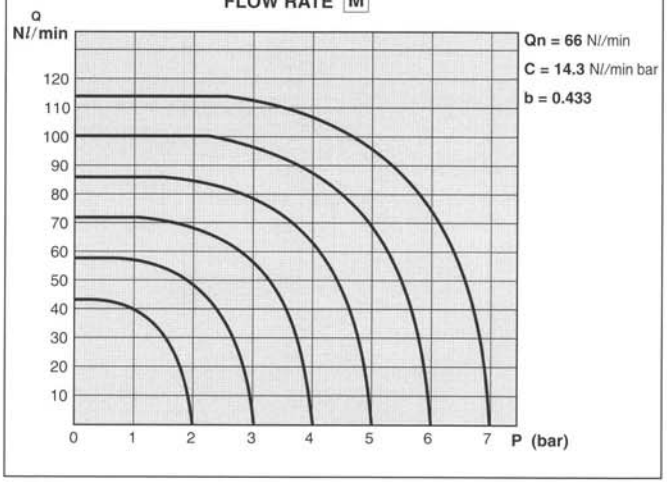
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

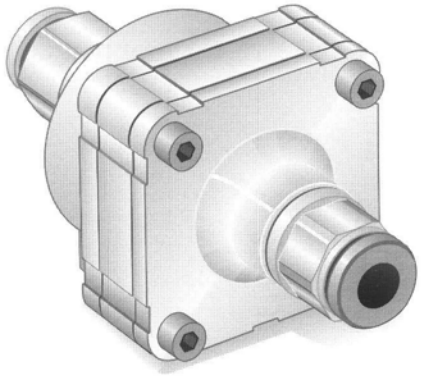
M	I 1 = 0.5 A	t 1 = 1.5 ms	I 2 = 0.2 A
N	I 1 = 0.8 A	t 1 = 1.5 ms	I 2 = 0.2 A
O	I 1 = 1.0 A	t 1 = 1.5 ms	I 2 = 0.3 A

FLOW RATE M



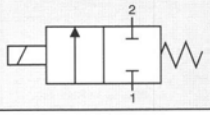
ELECTRICAL PORT CONNECTION

COLOUR	1 CONTROL	3 CONTROLS	9 CONTROLS
BLACK	COMMON	COMMON	COMMON
BROWN	—	1 - 2 - 9	1
RED	1 ⟶ 9	3 - 4 - 5	2
ORANGE	—	6 - 7 - 8	3
YELLOW	—	—	4
GREEN	—	—	5
BLUE	—	—	6
VIOLET	—	—	7
GREY	—	—	8
WHITE	—	—	9



CONTROL: DIRECT | PFM | PNM | PWM

N. 1 NC



GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)	
FILTRATION RATING	Min 40 micron	
TEMPERATURE	– 10 + 50°C (Standard version)	
RESPONSE TIME IN OPENING	24 < 5 ms	XX / KK < 1 ms
RESPONSE TIME IN CLOSING	24 < 2 ms	XX / KK < 1 ms
MAXIMUM FREQUENCY	200 Hz	500 Hz
WEIGHT	260 g	
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles	
IP RATING	IP 62	

IDENTIFICATION CODE

	M	X	8	5	1	9	0	0	C	2	24

OUTLETS

1	1 Outlet

FUNCTION

C	NC

MAXIMUM FLOW RATE (at 6 bar)

M	900 Nl/min
N	1260 Nl/min (control tension XX KK)
O	1620 Nl/min (control tension XX KK and Electrical control 3 9)

TYPE

2	2/2

CONTROL TENSION

24	24 VDC ± 10 %	2.9÷26.1 W
XX	Speed-up in current (48 VDC)	1.3÷12.1 W
KK	Speed-up in tension (24 VDC)	0.8÷ 7.6 W

No. ELECTRICAL CONTROLS

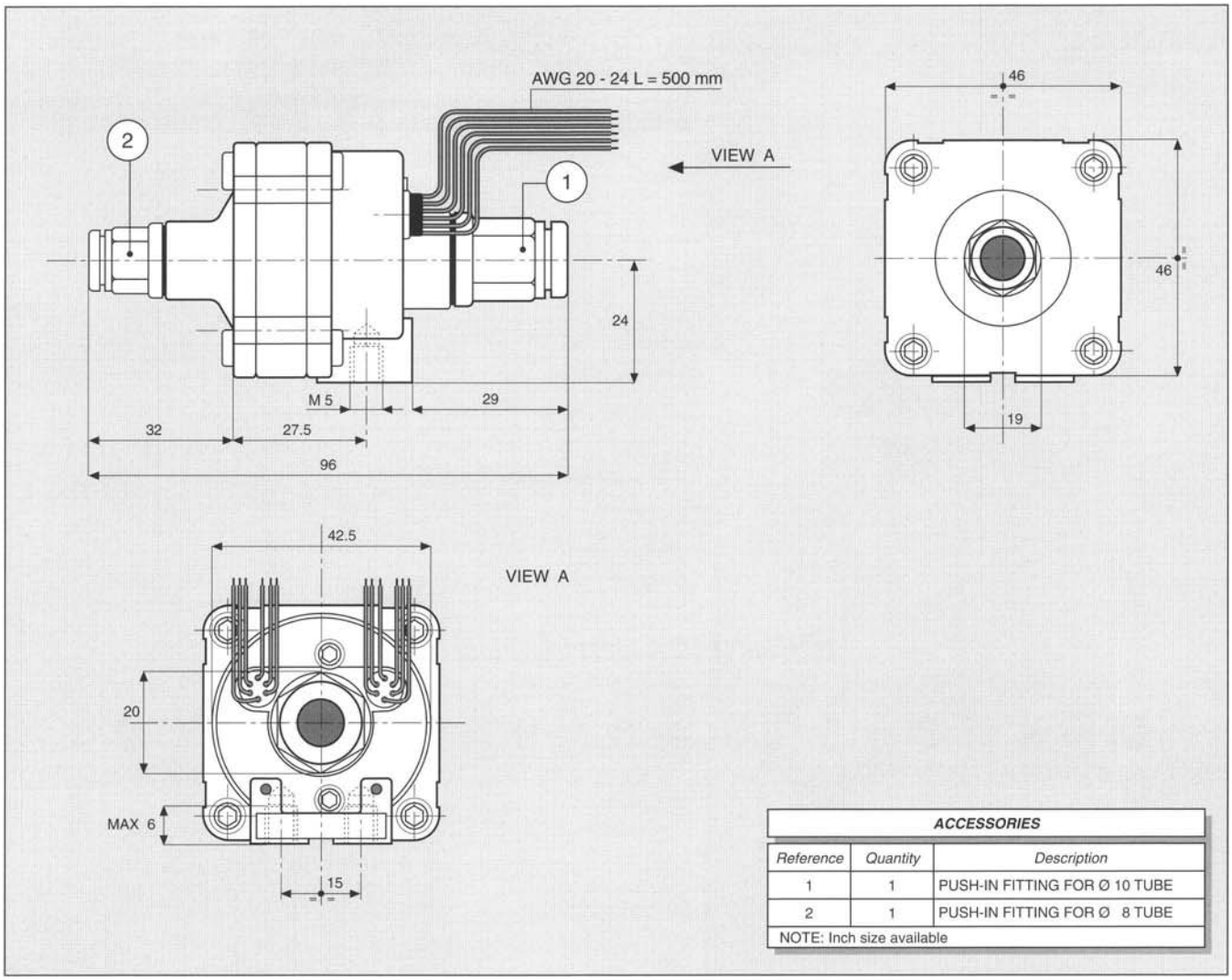
1	1 Control
3	3 Controls
9	9 Controls

OPERATING PRESSURE

	RANGE	*MODELS*
0	2 - 8 bar	All

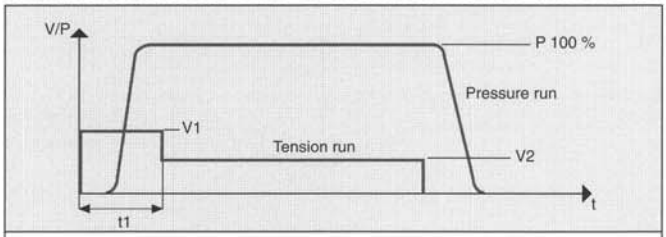
PORT CONNECTION

0	Integrated cables IP 62 L = 500 mm



ACCESSORIES		
Reference	*Quantity*	*Description*
1	1	PUSH-IN FITTING FOR Ø 10 TUBE
2	1	PUSH-IN FITTING FOR Ø 8 TUBE
NOTE: Inch size available		

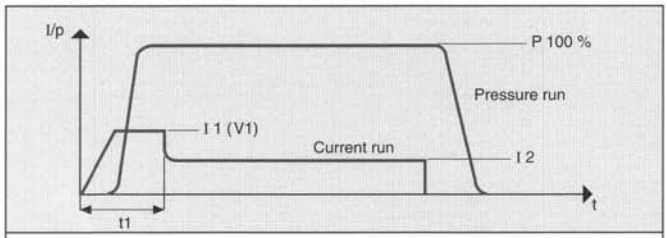
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

M	V 1 = 24 VDC	t 1 = 3 ms	V 2 = 5 VDC
N	V 1 = 24 VDC	t 1 = 4 ms	V 2 = 5 VDC

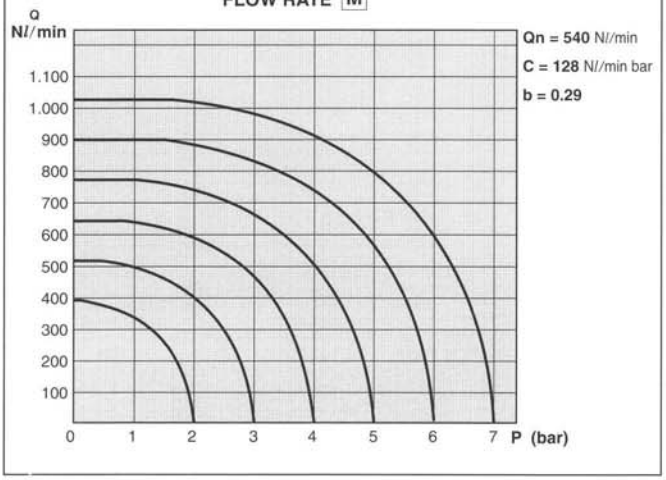
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

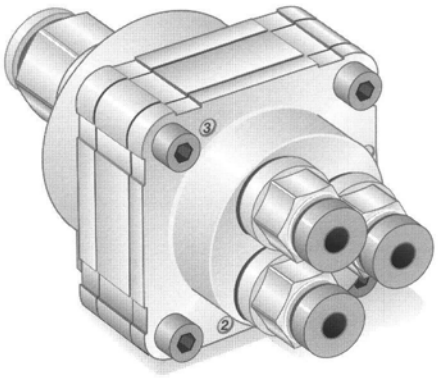
M	I 1 = 3.5 A	t 1 = 1.5 ms	I 2 = 1 A
N	I 1 = 4.0 A	t 1 = 1.5 ms	I 2 = 1 A

FLOW RATE M



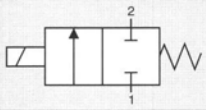
ELECTRICAL PORT CONNECTION

COLOUR	1 CONTROL	3 CONTROLS	9 CONTROLS
BLACK	COMMON	COMMON	COMMON
BROWN	—	1 - 2 - 9	1
RED	1 ⟶ 9	3 - 4 - 5	2
ORANGE	—	6 - 7 - 8	3
YELLOW	—	—	4
GREEN	—	—	5
BLUE	—	—	6
VIOLET	—	—	7
GREY	—	—	8
WHITE	—	—	9



CONTROL: DIRECT | PFM | PNM | PWM

N. 3 NC



GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)	
FILTRATION RATING	Min 40 micron	
TEMPERATURE	– 10 + 50°C (Standard version)	
RESPONSE TIME IN OPENING	24 < 5 ms	XX / KK < 1 ms
RESPONSE TIME IN CLOSING	24 < 2 ms	XX / KK < 1 ms
MAXIMUM FREQUENCY	200 Hz	500 Hz
WEIGHT	250 g	
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles	
IP RATING	IP 62	

IDENTIFICATION CODE

	M	X	8	5	3	3	0	0	C	2	24

OUTLETS

3	3 Outlets

FUNCTION

C	NC

MAXIMUM FLOW RATE (at 6 bar)

M	300 Nl/min
N	420 Nl/min (control tension XX KK)
O	520 Nl/min (control tension XX KK)

TYPE

2	2/2

CONTROL TENSION

24	24 VDC ± 10 %	2.9÷ 8.7W
XX	Speed-up in current (48 VDC)	1.3÷ 4.0W
KK	Speed-up in tension (24 VDC)	0.8÷ 2.5W

No. ELECTRICAL CONTROLS

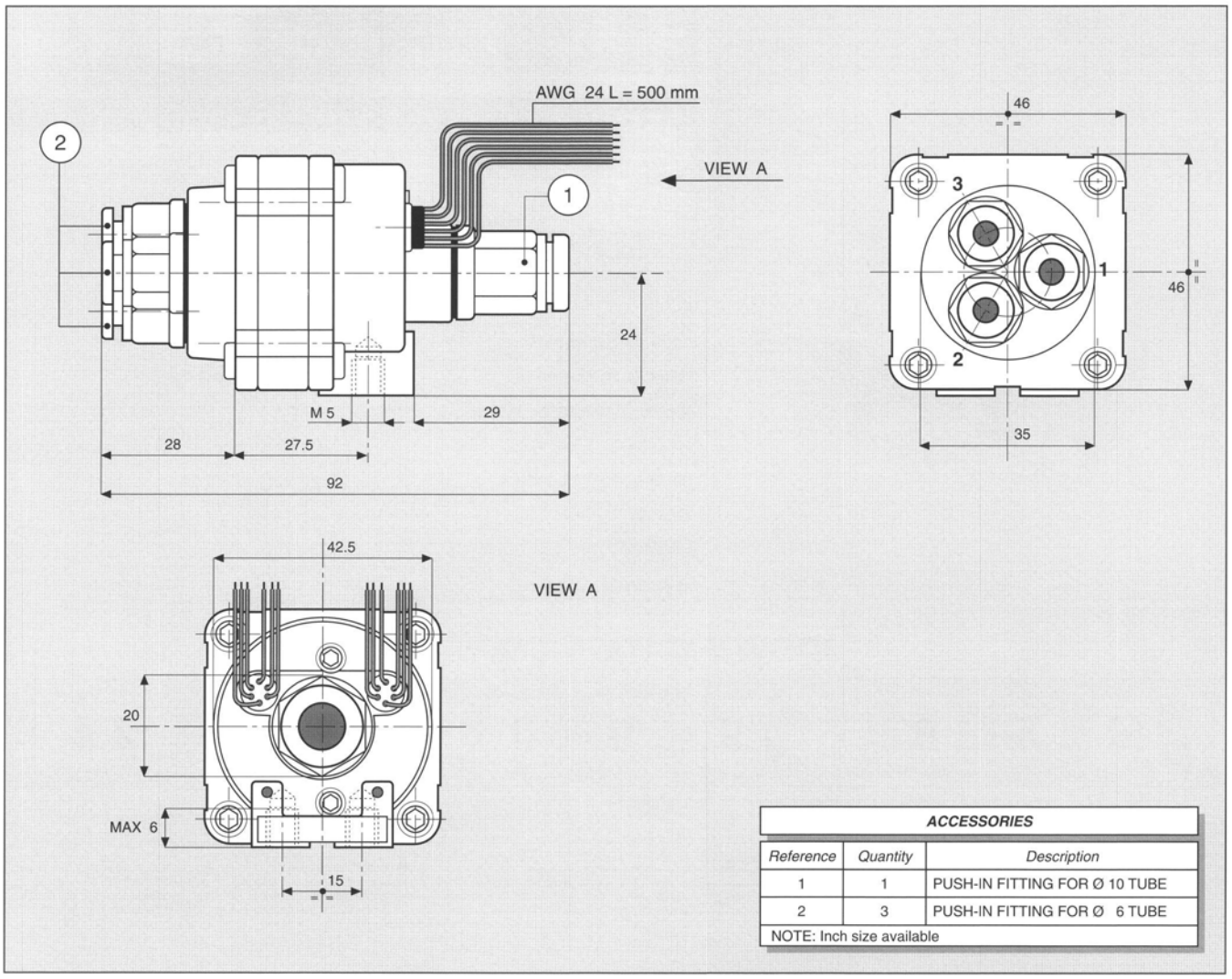
3	3 Controls
9	9 Controls

OPERATING PRESSURE

	RANGE	*MODELS*
0	2 - 8 bar	All

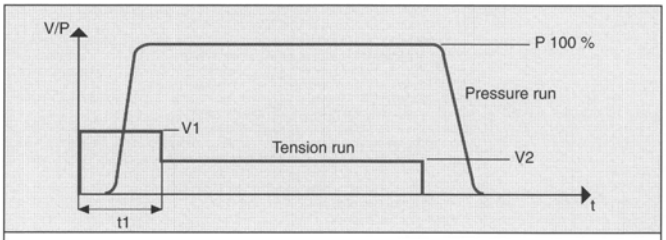
PORT CONNECTION

0	Integrated cables IP 62 L = 500 mm



ACCESSORIES		
Reference	*Quantity*	*Description*
1	1	PUSH-IN FITTING FOR Ø 10 TUBE
2	3	PUSH-IN FITTING FOR Ø 6 TUBE
NOTE: Inch size available		

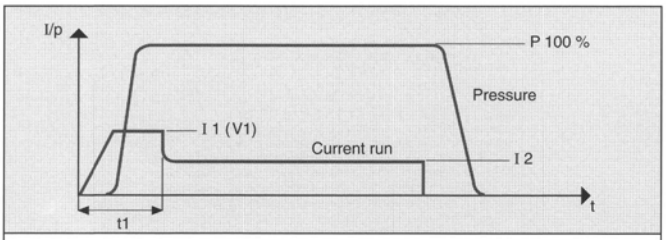
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

M	V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC
N	V 1 = 24 VDC	t 1 = 2.5 ms	V 2 = 5 VDC
O	V 1 = 24 VDC	t 1 = 3.5 ms	V 2 = 5 VDC

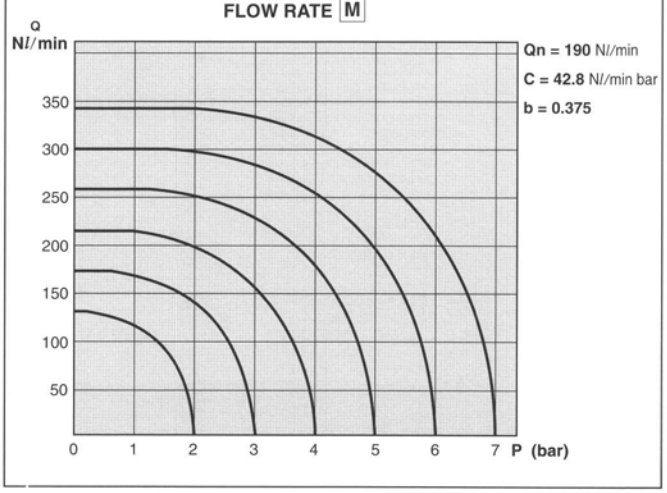
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

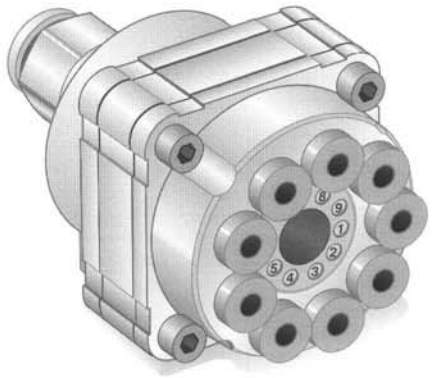
M	I 1 = 1 A	t 1 = 1.5 ms	I 2 = 0.3 A
N	I 1 = 1.5 A	t 1 = 1.5 ms	I 2 = 0.3 A
O	I 1 = 2.8 A	t 1 = 1.5 ms	I 2 = 0.3 A

FLOW RATE M



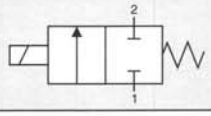
ELECTRICAL PORT CONNECTION

COLOUR	3 CONTROLS	9 CONTROLS (OUTLET)
BLACK	COMMON	COMMON
BROWN	1	1 (1)
RED	2	2 (1)
ORANGE	3	3 (2)
YELLOW	—	4 (2)
GREEN	—	5 (2)
BLUE	—	6 (3)
VIOLET	—	7 (3)
GREY	—	8 (3)
WHITE	—	9 (1)



CONTROL:	DIRECT	PFM	PWM	

N. 9 NC



GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)	
FILTRATION RATING	Min 40 micron	
TEMPERATURE	– 10 + 50°C (Standard version)	
RESPONSE TIME IN OPENING	24 < 5 ms	XX / KK < 1 ms
RESPONSE TIME IN CLOSING	24 < 2 ms	XX / KK < 1 ms
MAXIMUM FREQUENCY	200 Hz	500 Hz
WEIGHT	210 g	
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles	
IP RATING	IP 62	

IDENTIFICATION CODE

	M	X	8	5	9	9	0	0	C	2	24

OUTLETS

9	9 Outlets

FUNCTION

C	NC

FLOW RATE (at 6 bar)

M	100 Nl / min
N	140 Nl/min (control tension XX KK)
O	180 Nl/min (control tension XX KK)

TYPE

2	2/2

CONTROL TENSION

24	24 VDC ± 10 %	2.9 W
XX	Speed-up in current (48 VDC)	1.3 W
KK	Speed-up in tension (24 VDC)	0.8 W

No. ELECTRICAL CONTROLS

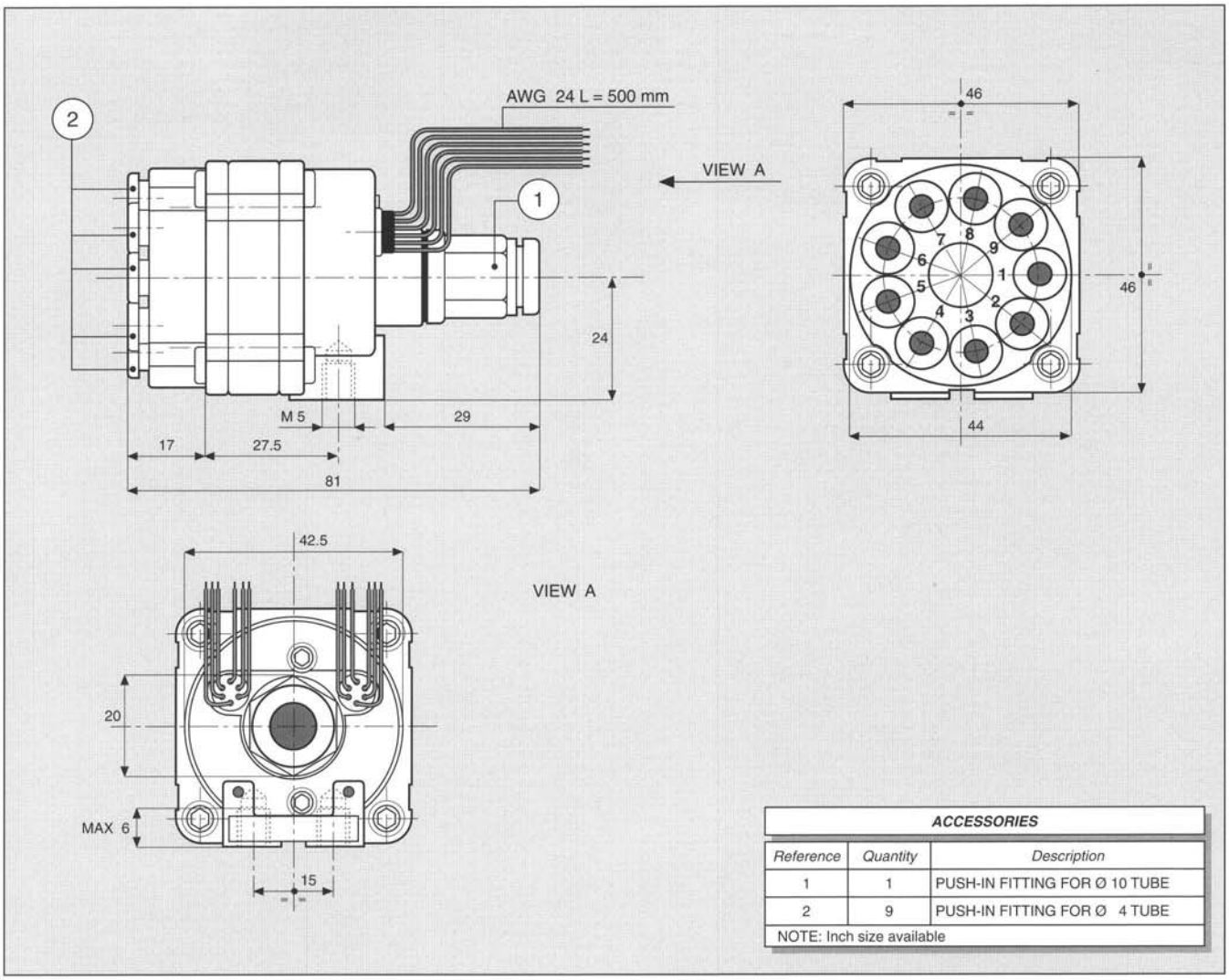
9	9 Controls

OPERATING PRESSURE

	RANGE	*MODELS*
0	2 - 8 bar	All

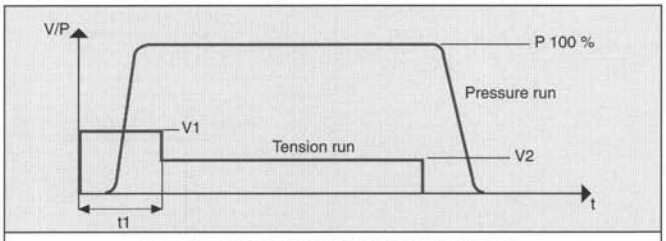
PORT CONNECTION

0	Integrated cables IP 62 L = 500 mm



ACCESSORIES		
Reference	*Quantity*	*Description*
1	1	PUSH-IN FITTING FOR Ø 10 TUBE
2	9	PUSH-IN FITTING FOR Ø 4 TUBE
NOTE: Inch size available		

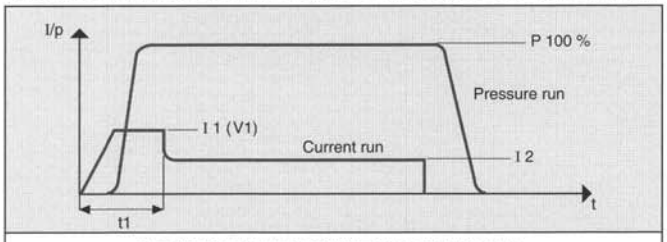
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

M	V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC
N	V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC
O	V 1 = 24 VDC	t 1 = 3 ms	V 2 = 5 VDC

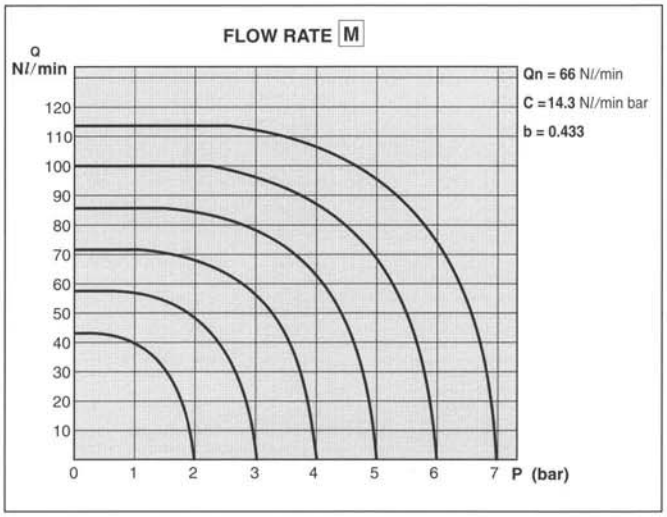
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

M	I 1 = 0.5 A	t 1 = 1.5 ms	I 2 = 0.2 A
N	I 1 = 0.8 A	t 1 = 1.5 ms	I 2 = 0.2 A
O	I 1 = 1.0 A	t 1 = 1.5 ms	I 2 = 0.3 A

FLOW RATE M

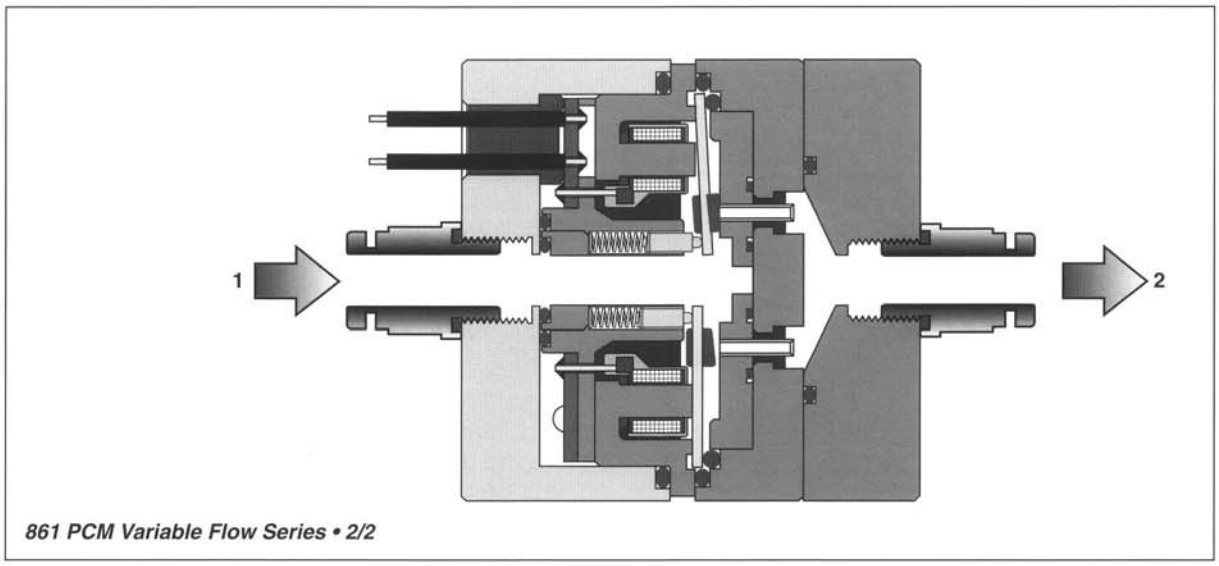


ELECTRICAL PORT CONNECTION

COLOUR	9 CONTROLS
BLACK	COMMON
BROWN	1
RED	2
ORANGE	3
YELLOW	4
GREEN	5
BLUE	6
VIOLET	7
GREY	8
WHITE	9

S.V. 860 PCM VARIABLE FLOW SERIES • 2/2

Pneumatic solenoid valves belonging to 860 PCM variable flow Series housed in a single body nine shutters separately controlled. Said shutters have different fluid flow and are conveyed to a single outlet port. The solenoid valves are flow proportional and characterized by a linear link between the whole flow rate and the control binary code. Therefore, they represent the ideal solution for the flow control in a digital way (PCM technique).
Response times both in opening and in closing are less than a millisecond and are independent from the flow value.
Consequently, value changes of the flow occur with a negligible phase lag (over 1 ms) as regards the electric control, even in the case of the instantaneous variation from the minimum to the maximum value, allowed by the solenoid valve.
The operation life is over 500 millions of cycles for every single shutter.
Valve models of 860 PCM variable flow Series are available with two different precision levels of flow rate control: 64 flow levels with 6-bit configuration and 256 flow level with 8-bit configuration.
Solenoid valves of 860 PCM variable flow Series may be integrated with the electronic PCM 8130 driver board, which provides their pilot control. They are also preset for both tension signal (0 to 10 V) processing, and digital processing (see «Electronic Driver Boards»).



861 PCM Variable Flow Series • 2/2

Advantages

- Compact dimension.
- Short response times.
- Insensitivity to vibrations.
- High precision and repetetiveness
- Long operating life.

Applications

- Process and precision instrumentation.
- Pressure and flow rate control devices.
- Actuators speed control.
- Positioning systems.
- Biomedical equipment.
- Robotics and industrial automation.

Materialis

- Body and flanges in Al.
- Seals in HNBR.

6-bit (64 levels) pattern	
Channel	C Nl / (min x bar)
1	54.20
2	27.10
3	13.55
4	6.77
5	3.39
6	1.69
—	—
—	—

8-bit (256 levels) pattern	
Channel	C Nl / (min x bar)
1	36.13
2	18.06
3	19.03
4	4.52
5	2.26
6	1.13
7	0.56
8	0.28

Picture 1 - Flow values of the single channels, rounded off to decimal second.

6-bit (64 levels) pattern	
Maximum flow	108.39 Nl / (min x bar)
Minimum flow	1.69 Nl / (min x bar)
Flow rate, maximum 6 bar	752.84 Nl / min

8-bit (256 levels) pattern	
Maximum flow	72.26 Nl / (min x bar)
Minimum flow	0.28 Nl / (min x bar)
Flow rate, maximum 6 bar	506.13 Nl / min

Picture 2 - The maximum flow value is determined by opening all channels

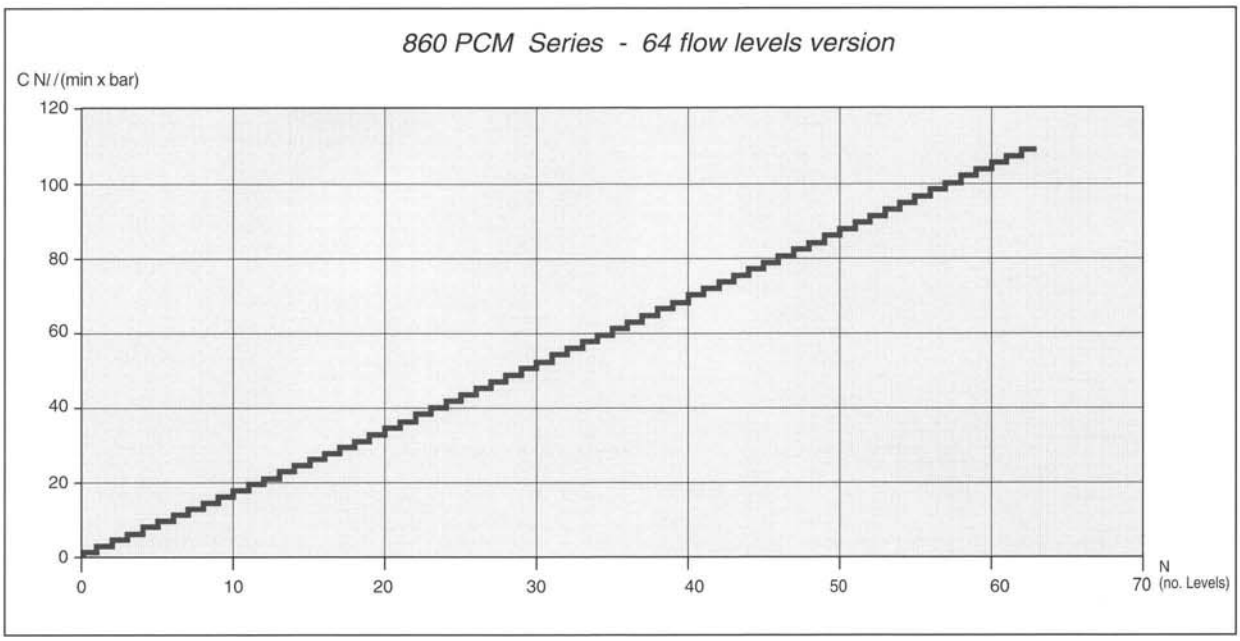
The lowest value of flow is determined by opening either the channel 6 (6-bit pattern) or the channel 8 (8-bit pattern). It represents the highest definition level of the solenoid valve.

The highest value of flow is determined by opening all channels. The condition corresponds to the maximum flow.

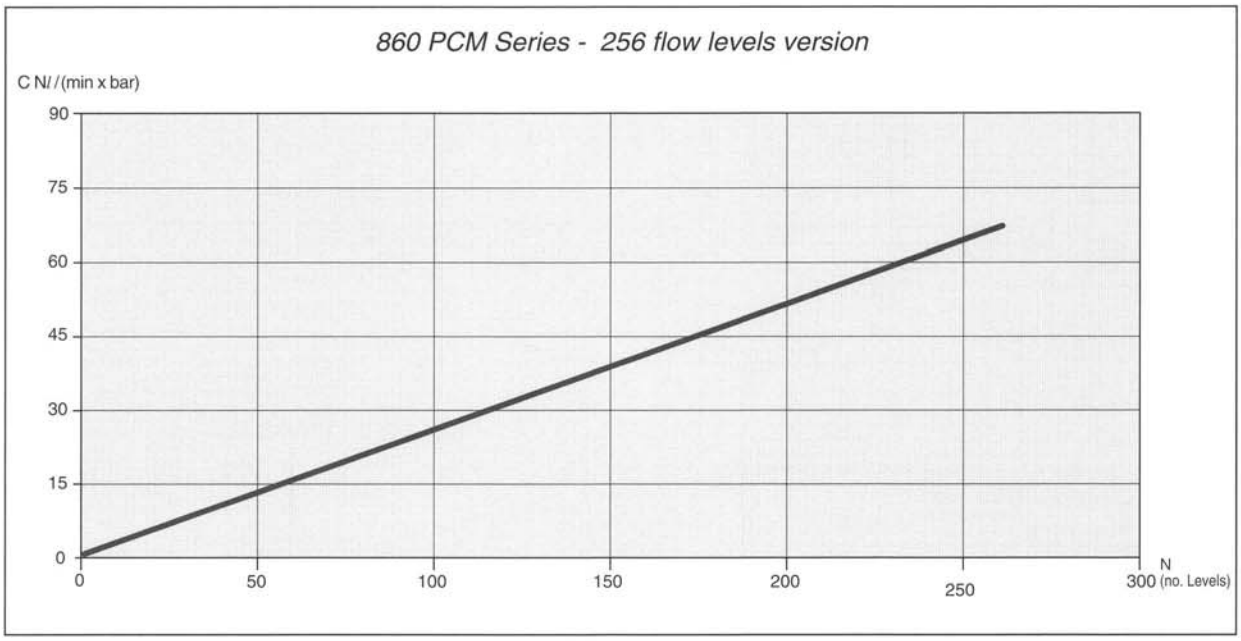
The total flow value is determined by the pattern (6-bit or 8-bit binary code), assumed by the channels, where 0-value represents the corresponding electrical OFF, and 1-value represents the corresponding electrical ON.

860 PCM Series - 64 flow levels version								
Level N	Channel pattern						Flow rate 6 bar Nl / min	C Nl / (min x bar)
	1	2	3	4	5	6		
	0	0	0	0	0	0	0	0
1	0	0	0	0	0	1	11.86	1.96
2	0	0	0	0	1	0	23.72	3.39
3	0	0	0	0	1	1	35.57	5.08
4	0	0	0	1	0	0	47.43	6.78
5	0	0	0	1	0	1	59.29	8.47
6	0	0	0	1	1	0	71.15	10.16
7	0	0	0	1	1	1	83.01	11.86
8	0	0	1	0	0	0	94.86	13.55
9	0	0	1	0	0	1	106.72	15.25
10	0	0	1	0	1	0	118.58	16.94
.....	...	...	...	...	...	...	...	...

Picture. 3 - Ratio of N levels, channel patterns, flow rate and C. For lack of space, only the first 10 levels are shown here.

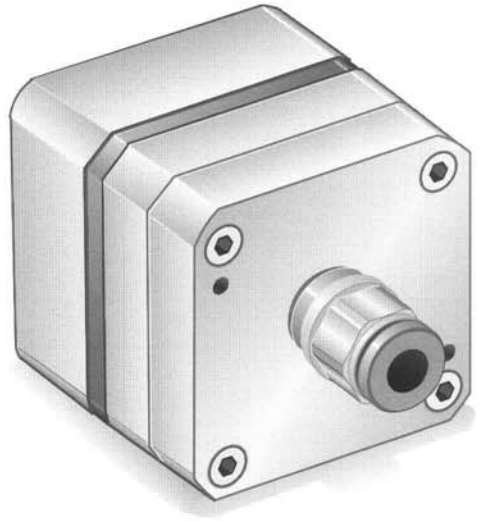


Picture 4 - Flow run upon varying N (64 levels).



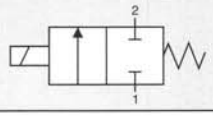
Picture 5 - Flow run upon varying N (256 levels).

861 PCM VARIABLE FLOW • 2/2 NC



CONTROL:	PCM

N. 1 NC



GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)
FILTRATION RATING	Min 40 micron
TEMPERATURE	– 10 + 50°C (Standard version)
RESPONSE TIME IN OPENING	KK < 1 ms
RESPONSE TIME IN CLOSING	KK < 1 ms
MAXIMUM FREQUENCY	500 Hz
WEIGHT	450 g
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles
IP RATING	IP 52 - IP 65

IDENTIFICATION CODE

	P	X	8	6	1	9	E	3	C	2	K K

OUTLETS

1	1 Outlet

FUNCTION

C	NC

FLOW RATE

P	N. 64 FLOW RATES	
	Maximum flow	108.39 Nl/(min • bar)
	Minimum flow	1.69 Nl/(min • bar)
	6-bar flow rate maximum	752.84 Nl/min
Q	N. 256 FLOW RATES	
	Maximum flow	72.26 Nl/(min • bar)
	Minimum flow	0.28 Nl/(min • bar)
	6-bar flow rate maximum	506.13 Nl/min

TYPE

2	2/2

No. ELECTRICAL CONTROLS

9	9 Controls

CONTROL TENSION

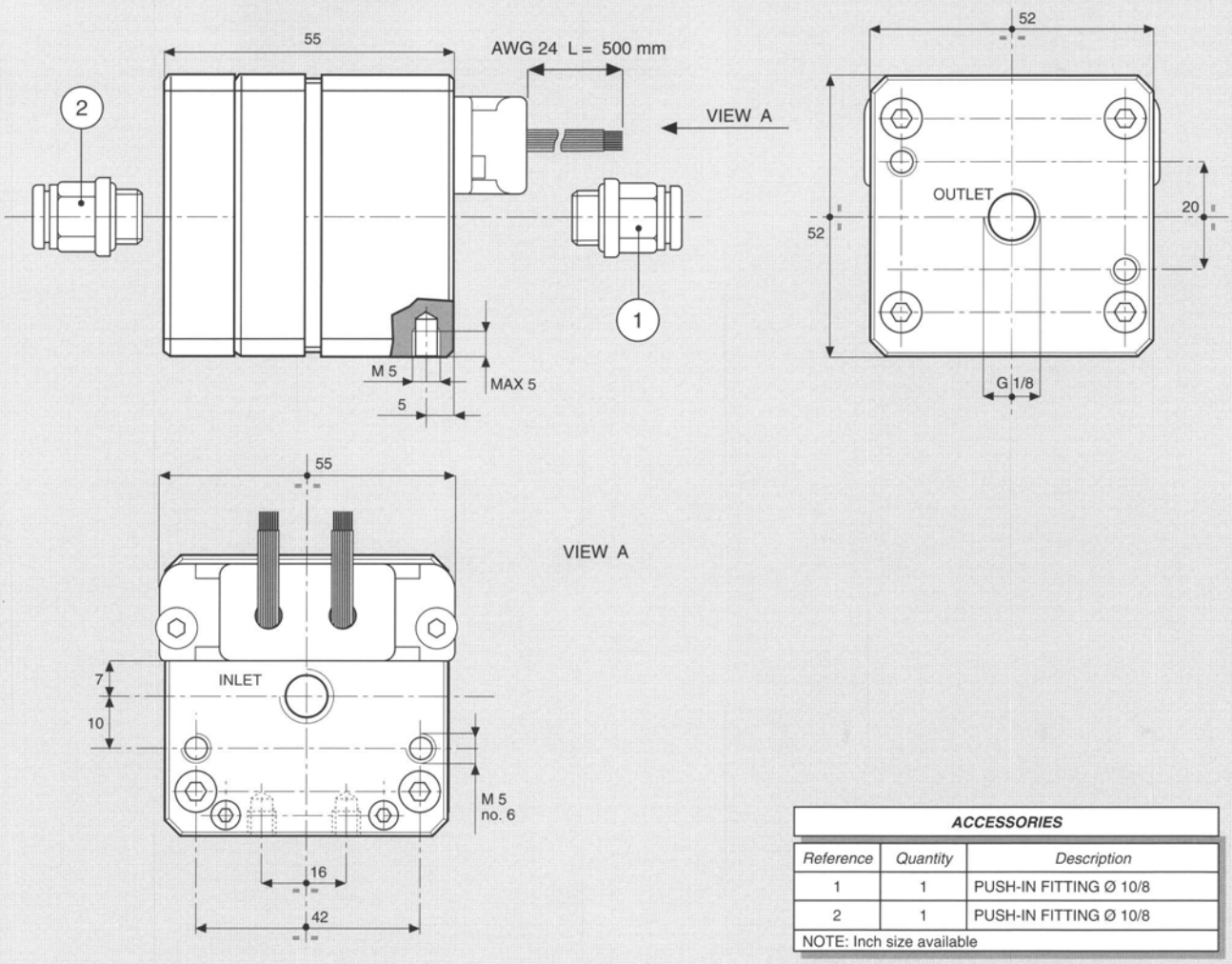
KK	Speed-up in tension	0.8 W

PORT CONNECTION

E	Presetting for Easy connection IP 52 - IP 65

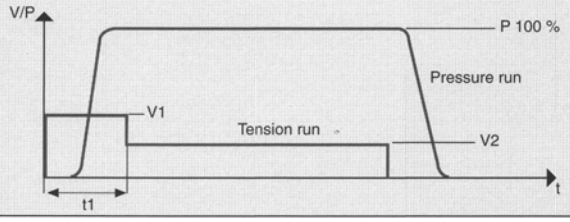
OPERATING PRESSURE

	RANGE	*MODELS*
3	0 - 6 bar	All



ACCESSORIES		
Reference	*Quantity*	*Description*
1	1	PUSH-IN FITTING Ø 10/8
2	1	PUSH-IN FITTING Ø 10/8
NOTE: Inch size available		

CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 3 ms	V 2 = 5 VDC

ELECTRICAL PORT CONNECTION VERSION PX (64 LEVELS / 6-BIT)

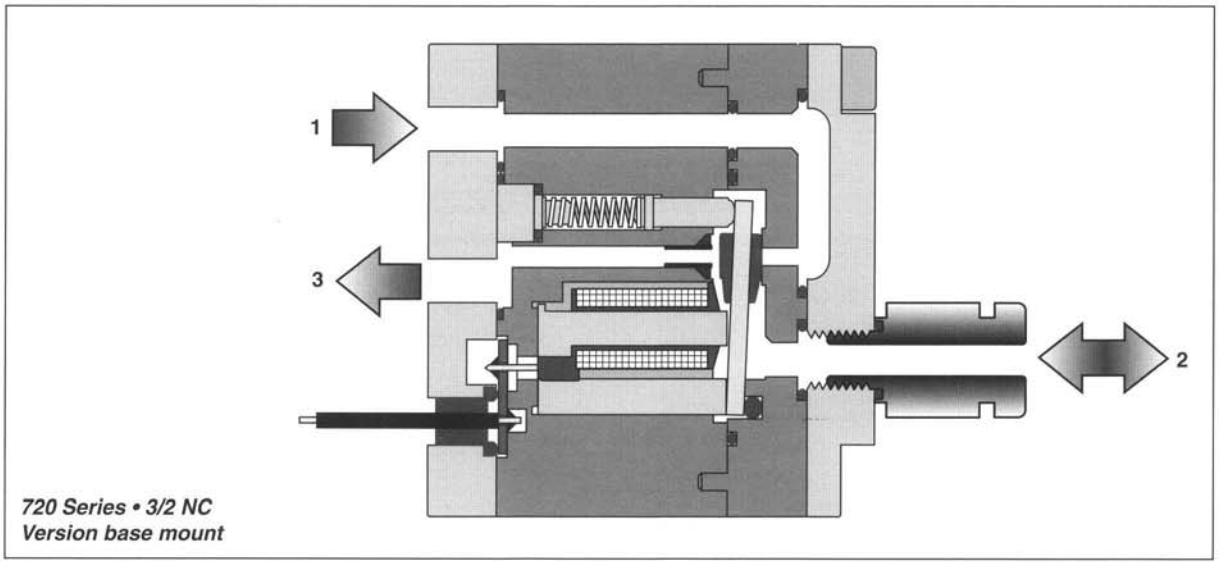
COLOUR	6 CONTROLS
BLACK	COMMON
BROWN	1
RED	1
ORANGE	1
YELLOW	2
GREEN	2
BLUE	3
VIOLET	4
GREY	5
WHITE	6

ELECTRICAL PORT CONNECTION VERSION QX (256 LEVELS / 8-BIT)

COLOUR	8 CONTROLS
BLACK	COMMON
BROWN	1
RED	1
ORANGE	2
YELLOW	3
GREEN	4
BLUE	5
VIOLET	6
GREY	7
WHITE	8

SOLENOID VALVES 720 SERIES • 2/2 • 3/2

Pneumatic solenoid valves of 720 Series are available in both NC and NO version. They include all innovations, which are present in Matrix solenoid valves, both in materials and in operating principles. They couple simplicity and reliability with high dynamic performance. Response times are of milliseconds range, while their operating life is over 500 million cycles. The Series comprises Vacuum versions designed for uses with vacuum technique.
Due to the facility to be speed-up controlled, dynamic characteristics become even more improved: standard solenoid valves equipped with 24 VDC control present response times lower than 5 ms in opening and 2 ms in closing, with a maximum operation frequency 200 Hz. On the contrary, solenoid valves equipped with speed- up control present a response time both in opening and closing lower than 2 ms, with a maximum operation frequency 300 Hz.
Besides high-speed characteristics, solenoid valves 720 Series offer flow rate value to 100 ℓ/minute (ANR), with supply pressure from 0 to 8 bar.
720 Series is available both in line assembly version and on sub-plate and is equipped with a range of accessories such as multi-position manifolds and speed-up driver boards



720 Series • 3/2 NC
Version base mount

Advantages

- Compact dimension.
- High duct diameter and flow rate.
- Short response times.
- Insensitivity to frequency work and to vibrations.
- Low absorbed power.
- Precision, repetitiveness and flexibility.
- Long operating life.

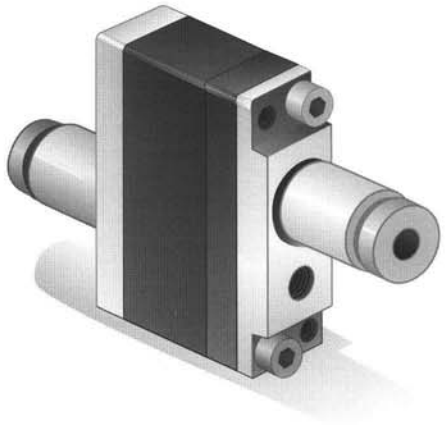
Applications

- Process and precision instrumentation.
- Pressure and flow rate control devices.
- Positioning systems.
- Pilot systems.
- Selection systems.
- Metering systems.
- Biomedical and measure sector.
- Industrial automation.

Materials

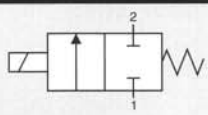
- Body in PPS.
- Flanges in Al.
- Seals in NBR (shutters in HNBR on request).

NC NO

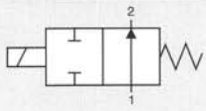


CONTROL: DIRECT | PFM | PWM

N. 1 NC



N. 1 NO



GENERAL CHARACTERISTICS

FLUID	Non-lubrifcated dry air, neutral gases (–10 + 50°C)		
FILTRATION RATING	Min 40 micron		
TEMPERATURE	– 10 + 50°C (Standard version)		
RESPONSE TIME IN OPENING	12 / 24 < 7 ms	JJ < 5 ms	XX / KK < 2 ms
RESPONSE TIME IN CLOSING	12 / 24 < 3 ms	JJ < 2 ms	XX / KK < 2 ms
MAXIMUM FREQUENCY	100 Hz	200 Hz	300 Hz
WEIGHT	35 g		
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles		
IP RATING	IP 62		

IDENTIFICATION CODE

	H	X	7	2	1	1	0	2	C	2	24

OUTLETS

1	1 Outlet

FUNCTION

A	NO
C	NC

FLOW RATE (at 6 bar)

H	50 Nl / min
B	80 Nl / min
M	100 Nl / min (control tension JJ XX KK)

TYPE

2	2/2

VERSION

	Body ported
H	Body ported - HNBR Shutters
F	Manifold
J	Manifold - HNBR Shutters

CONTROL TENSION

12	12 VDC ± 10 %	ED 100 %	1.4 W
24	24 VDC ± 10 %	ED 100 %	1.2 W
JJ	24 VDC ± 10 %	ED 100 % (1)	1.9 W
XX	Speed-up in current	ED 100 % (1)	—
KK	Speed-up in tension	ED 100 % (1)	—

(1) Only with Electronic Driver Boards PRB or UDB

No. ELECTRICAL CONTROLS

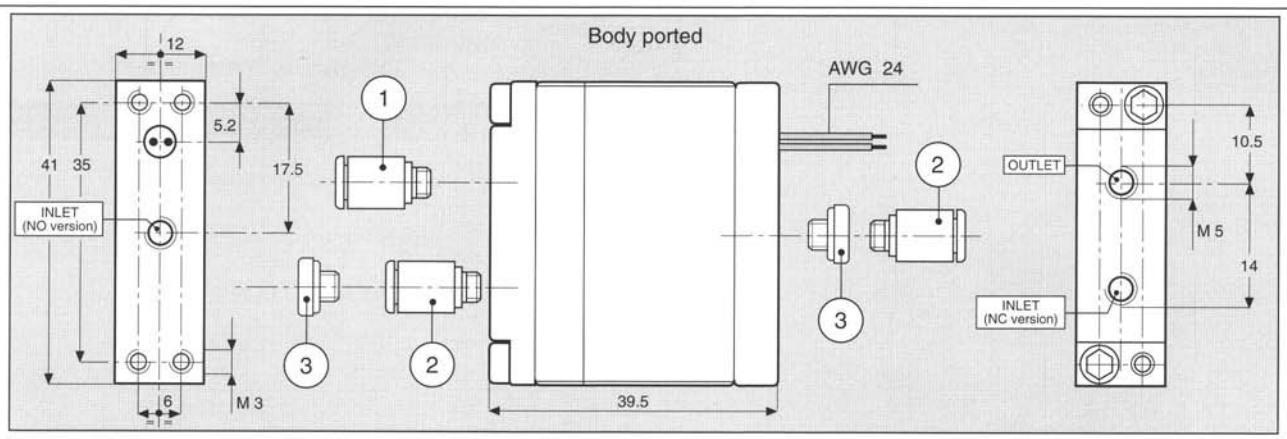
1	1 Control

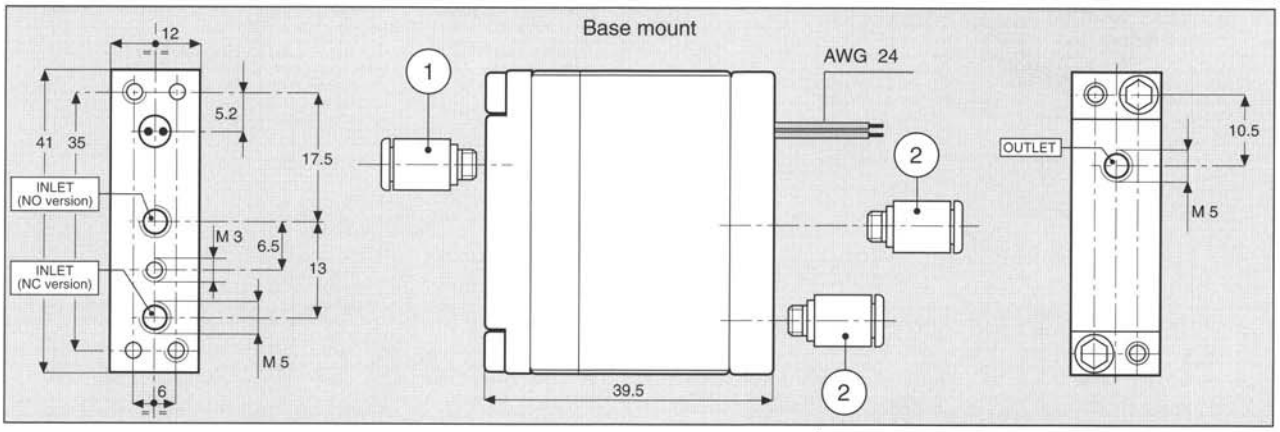
OPERATING PRESSURE

	RANGE	*MODELS*
1	0 - 4 bar	All
2	4 - 8 bar	All
3	0 - 8 bar	..... XX / KK
8	2 - 6 bar	All

PORT CONNECTION

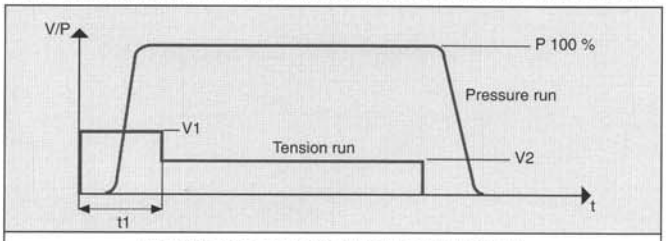
0	Integrated cables IP 62 L = 500 mm
1	Integrated cables IP 62 L = 100 mm





ACCESSORIES		
Reference	*Quantity*	*Description*
1	1	PUSH-IN FITTING Ø 4/6
2	1	PUSH-IN FITTING Ø 4/6
3	1	PLUG
NOTE: Inch size available		

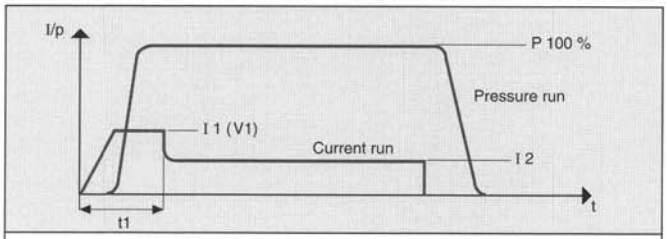
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC

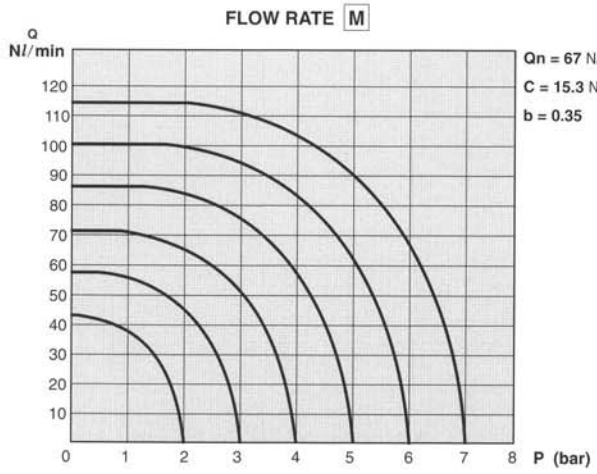
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

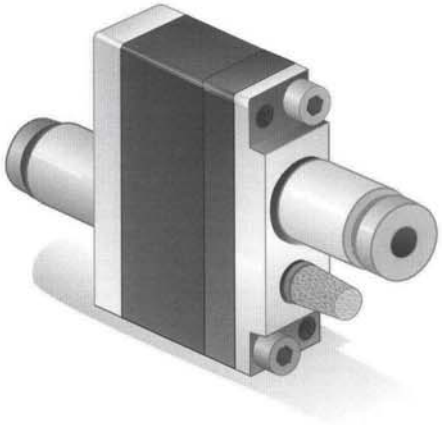
I 1 = 0.7 A	t 1 = 2 ms	I 2 = 0.3 A

FLOW RATE M

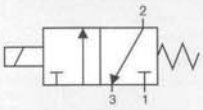
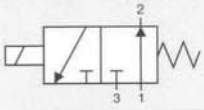


721 • 3/2

NC NO



CONTROL: DIRECT

N. 1 NC	N. 1 NO
	

GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)		
FILTRATION RATING	Min 40 micron		
TEMPERATURE	– 10 + 50°C (Standard version)		
RESPONSE TIME IN OPENING	12 / 24 < 7 ms	JJ < 5 ms	XX / KK < 2 ms
RESPONSE TIME IN CLOSING	12 / 24 < 3 ms	JJ < 2 ms	XX / KK < 2 ms
MAXIMUM FREQUENCY	100 Hz	200 Hz	300 Hz
WEIGHT	35 g		
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles		
IP RATING	IP 62		

IDENTIFICATION CODE

	H	X	7	2	1	1	0	2	C	3	24

OUTLETS

1	1 Outlet

FUNCTION

A	NO
C	NC

FLOW RATE (at 6 bar)

H	50 Nl / min
B	80 Nl / min
M	100 Nl / min (control tension JJ XX KK)

TYPE

3	3/2

VERSION

	Body ported
H	Body ported - HNBR Shutters
F	Manifold
J	Manifold - HNBR Shutters

CONTROL TENSION

12	12 VDC ± 10 %	ED 100 %	1.4 W
24	24 VDC ± 10 %	ED 100 %	1.2 W
JJ	24 VDC ± 10 %	ED 100 % (1)	1.9 W
XX	Speed-up in current	ED 100 % (1)	—
KK	Speed-up in tension	ED 100 % (1)	—

(1) Only with Electronic Driver Boards PRB or UDB

No. ELECTRICAL CONTROLS

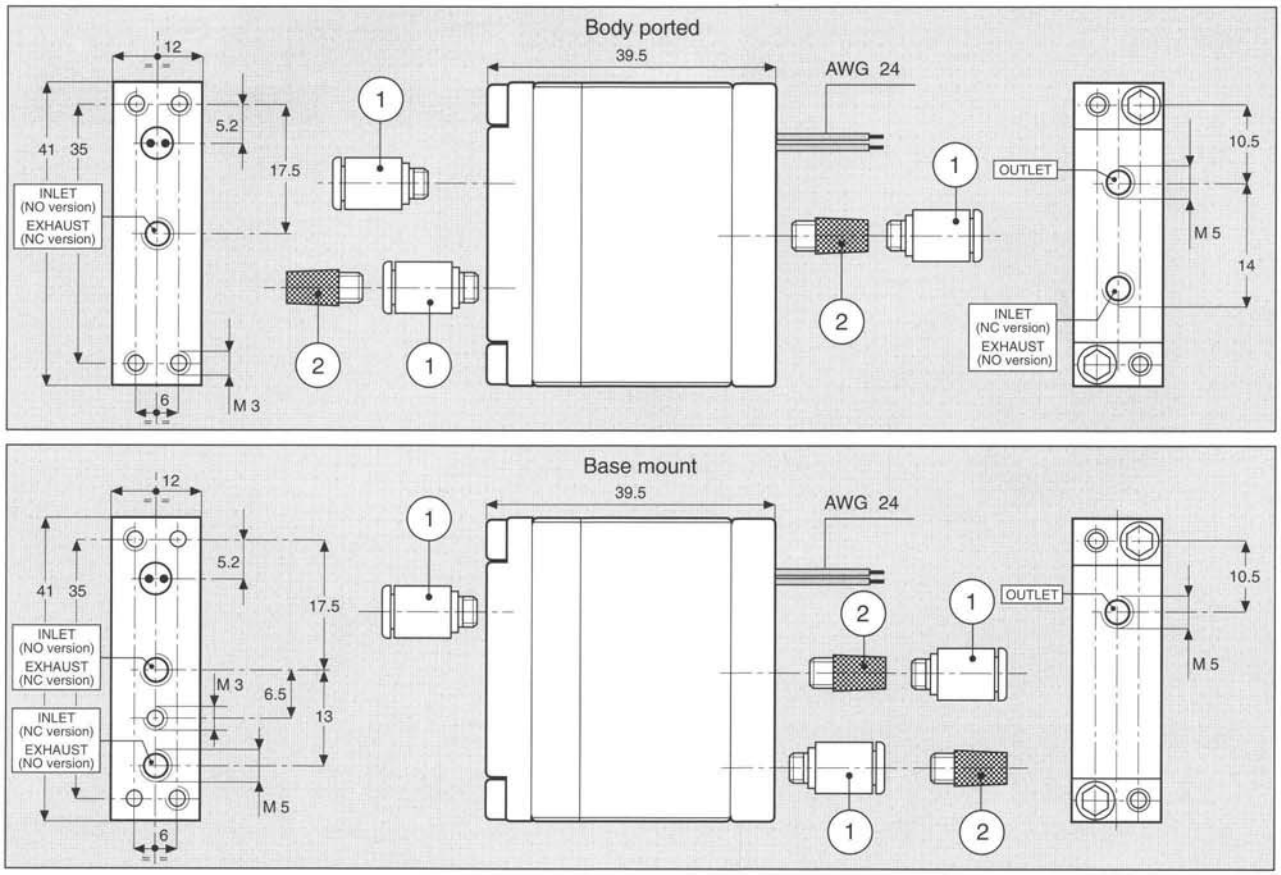
1	1 Control

OPERATING PRESSURE

	RANGE	*MODELS*
1	0 - 4 bar	All
2	4 - 8 bar	All
3	0 - 8 bar	..... XX / KK
8	2 - 6 bar	All

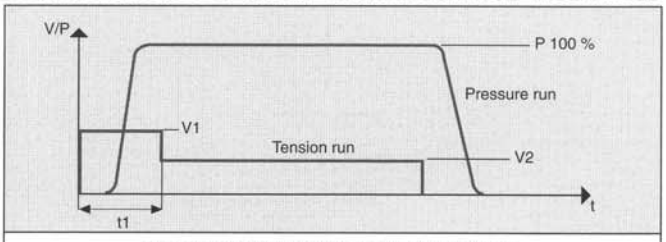
PORT CONNECTION

0	Integrated cables IP 62 L = 500 mm
1	Integrated cables IP 62 L = 100 mm



ACCESSORIES		
Reference	*Quantity*	*Description*
1	2	PUSH-IN FITTING Ø 4/6
2	1	SILENCER
NOTE: Inch size available		

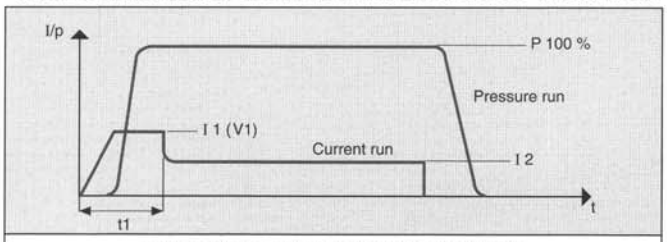
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC

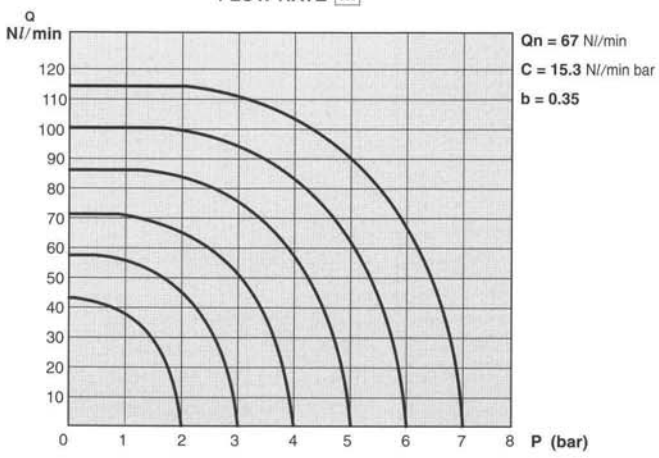
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

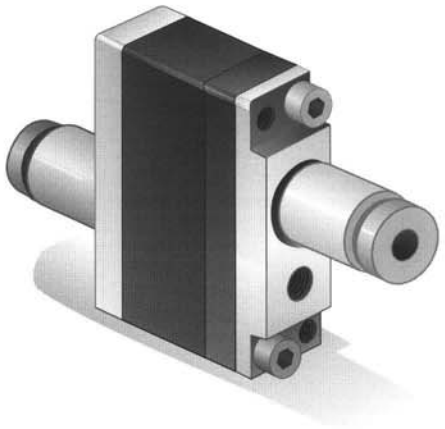
I 1 = 0.7 A	t 1 = 2 ms	I 2 = 0.3 A

FLOW RATE M



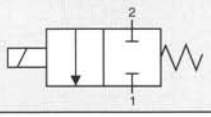
721 VACUUM • 2/2

NC NO

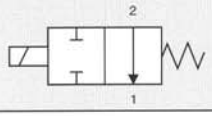


CONTROL: DIRECT | PFM | PWM

N. 1 NC



N. 1 NO



GENERAL CHARACTERISTIC

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)		
FILTRATION RATING	Min 40 micron		
TEMPERATURE	– 10 + 50°C (Standard version)		
RESPONSE TIME IN OPENING	12 / 24 < 7 ms	JJ < 5 ms	XX / KK < 2 ms
RESPONSE TIME IN CLOSING	12 / 24 < 3 ms	JJ < 2 ms	XX / KK < 2 ms
MAXIMUM FREQUENCY	100 Hz	200 Hz	300 Hz
WEIGHT	35 g		
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles		
IP RATING	IP 62		

IDENTIFICATION CODE

	H	X	7	2	1	1	0	V	A	2	24

OUTLETS

1	1 Outlet

FUNCTION

A	NO
C	NC

ORIFICE

H	Ø eq = 0.9 mm
B	Ø eq = 1.3 mm
M	Ø eq = 1.5 mm (control tension JJ XX KK)

TYPE

2	2/2

VERSION

	Body ported
H	Body ported - HNBR Shutters
F	Manifold
J	Manifold - HNBR Shutters

CONTROL TENSION

12	12 VDC ± 10 %	ED 100 %	1.4 W
24	24 VDC ± 10 %	ED 100 %	1.2 W
JJ	24 VDC ± 10 %	ED 100 % (1)	1.9 W
XX	Speed-up in current	ED 100 % (1)	—
KK	Speed-up in tension	ED 100 % (1)	—

(1) Only with Electronic Driver Boards PRB or UDB

No. ELECTRICAL CONTROLS

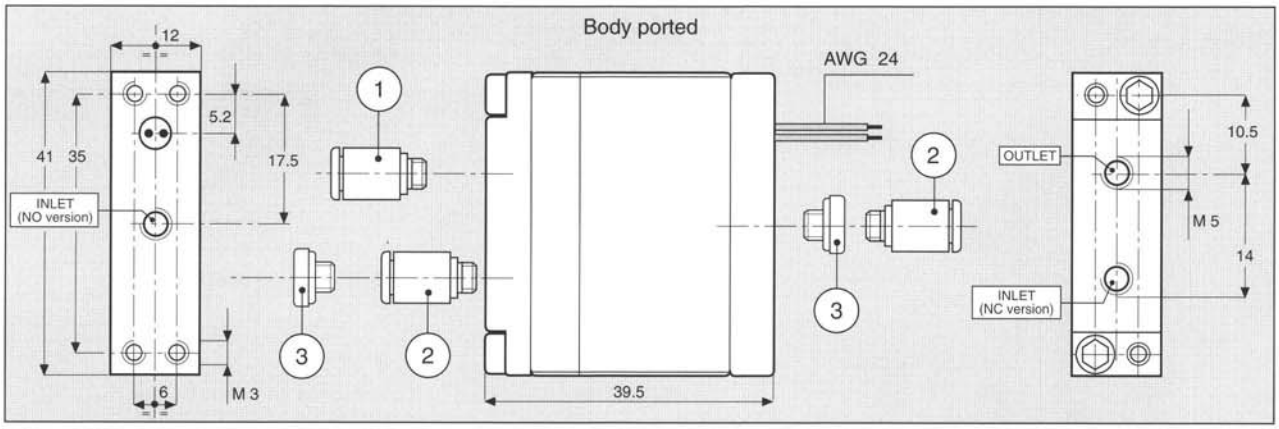
1	1 Control

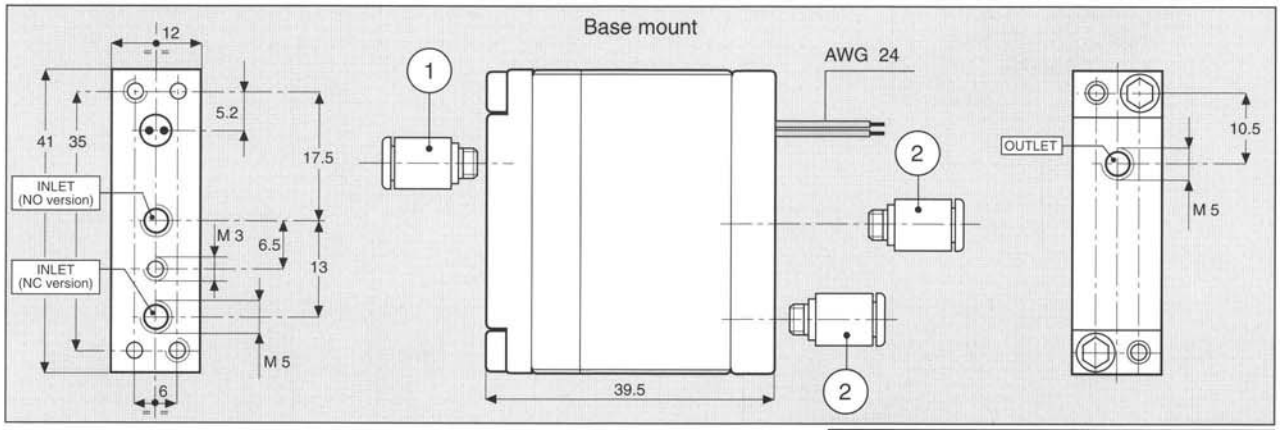
OPERATING PRESSURE

	RANGE	*MODELS*
V	10^{-5} Torr	All

PORT CONNECTION

0	Integrated cables IP 62 L = 500 mm
1	Integrated cables IP 62 L = 100 mm

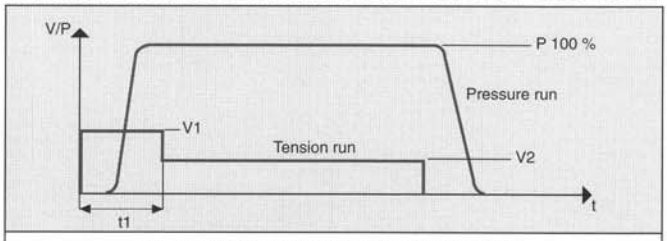




ACCESSORIES

Reference	*Quantity*	*Description*
1	1	VACUUM FITTING Ø 4/6
2	1	VACUUM FITTING Ø 4/6
3	1	PLUG
NOTE: Inch size available		

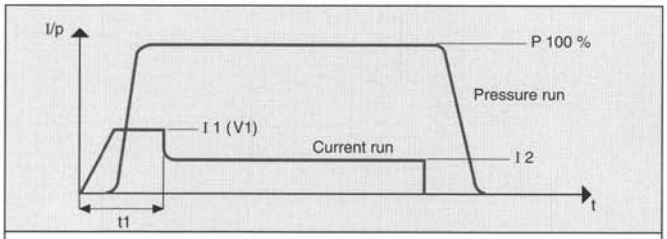
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC

CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX

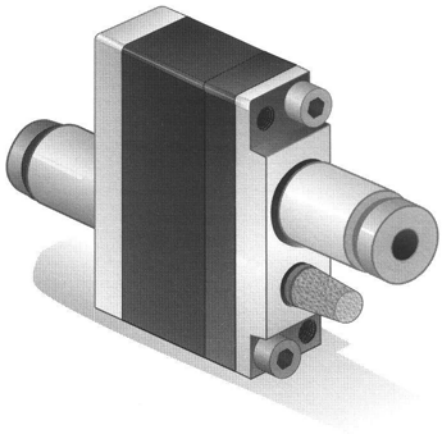


N.B. XX MODELS ARE CONTROLLED IN CURRENT

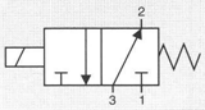
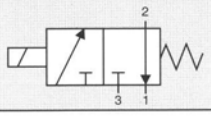
I 1 = 0.7 A	t 1 = 2 ms	I 2 = 0.3 A

721 VACUUM • 3/2

NC NO



CONTROL: DIRECT

N. 1 NC	N. 1 NO
	

GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gasesi (–10 + 50°C)		
FILTRATION RATING	Min 40 micron		
TEMPERATURE	– 10 + 50°C (Standard version)		
RESPONSE TIME IN OPENING	12 / 24 < 7 ms	JJ < 5 ms	XX / KK < 2 ms
RESPONSE TIME IN CLOSING	12 / 24 < 3 ms	JJ < 2 ms	XX / KK < 2 ms
MAXIMUM FREQUENCY	100 Hz	200 Hz	300 Hz
WEIGHT	35 g		
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles		
IP RATING	IP 62		

IDENTIFICATION CODE

	H	X	7	2	1	1	0	V	A	3	24

OUTLETS

1	1 Outlet

FUNCTION

A	NO
C	NC

ORIFICE

H	Ø eq = 0.9 mm
B	Ø eq = 1.3 mm
M	Ø eq = 1.5 mm (control tension JJ XX KK)

TYPE

3	3/2

VERSION

	Body ported
H	Body ported - HNBR Shutters
F	Manifold
J	Manifold - HNBR Shutters

CONTROL TENSION

12	12 VDC ± 10 %	ED 100 %	1.4 W
24	24 VDC ± 10 %	ED 100 %	1.2 W
JJ	24 VDC ± 10 %	ED 100 % (1)	1.9 W
XX	Speed-up in current	ED 100 % (1)	—
KK	Speed-up in tension	ED 100 % (1)	—

(1) Only with Electronic Driver Boards PRB or UDB

No . ELECTRICAL CONTROLS

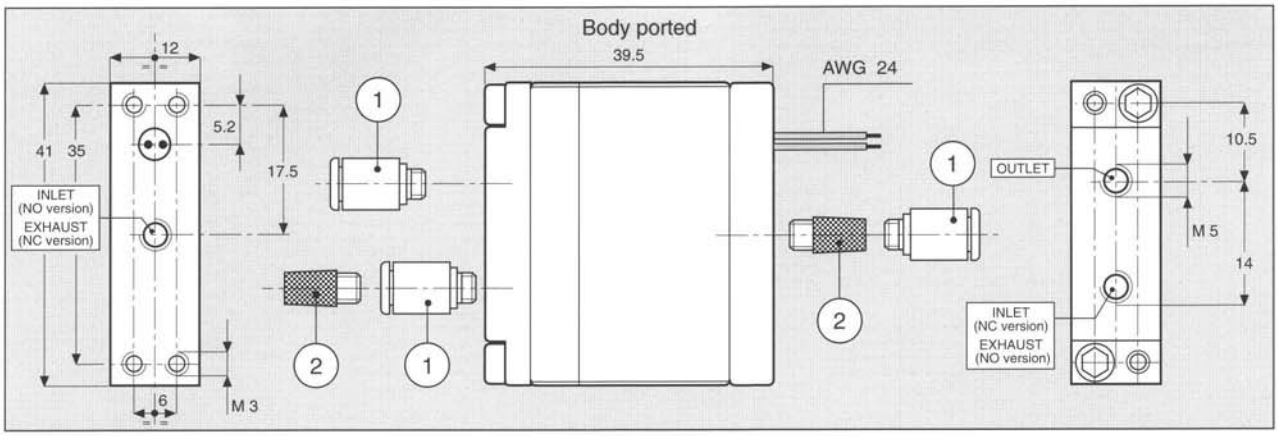
1	1 Control

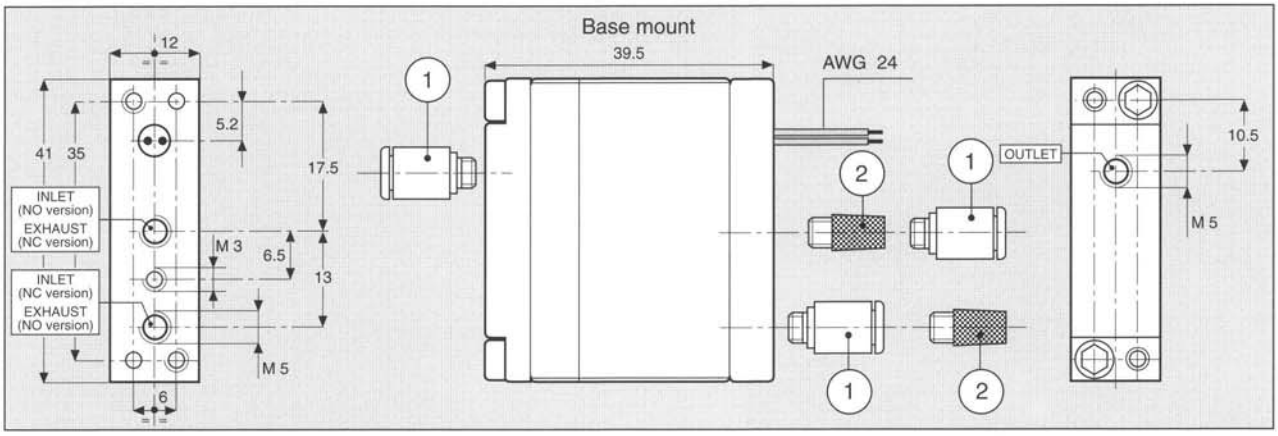
OPERATING PRESSURE

	RANGE	*MODELS*
V	10^{-5} Torr	All

PORT CONNECTION

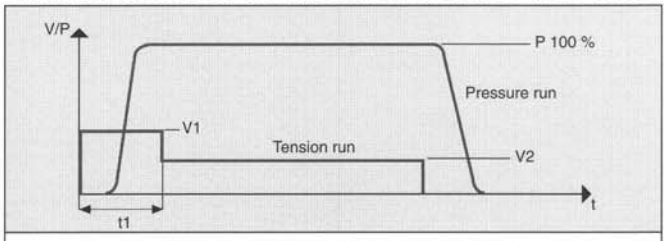
0	Integrated cables IP 62 L = 500 mm
1	Integrated cables IP 62 L = 100 mm





ACCESSORIES		
Reference	*Quantity*	*Description*
1	2	VACUUM FITTING Ø 4/6
2	1	SILENCER
NOTE: Inch size available		

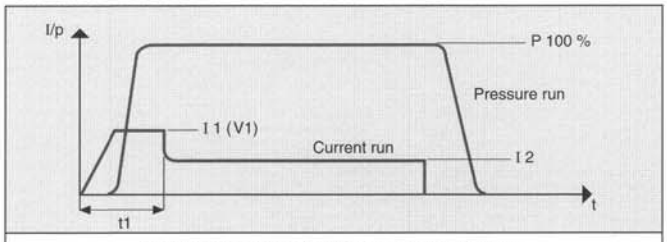
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC

CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX

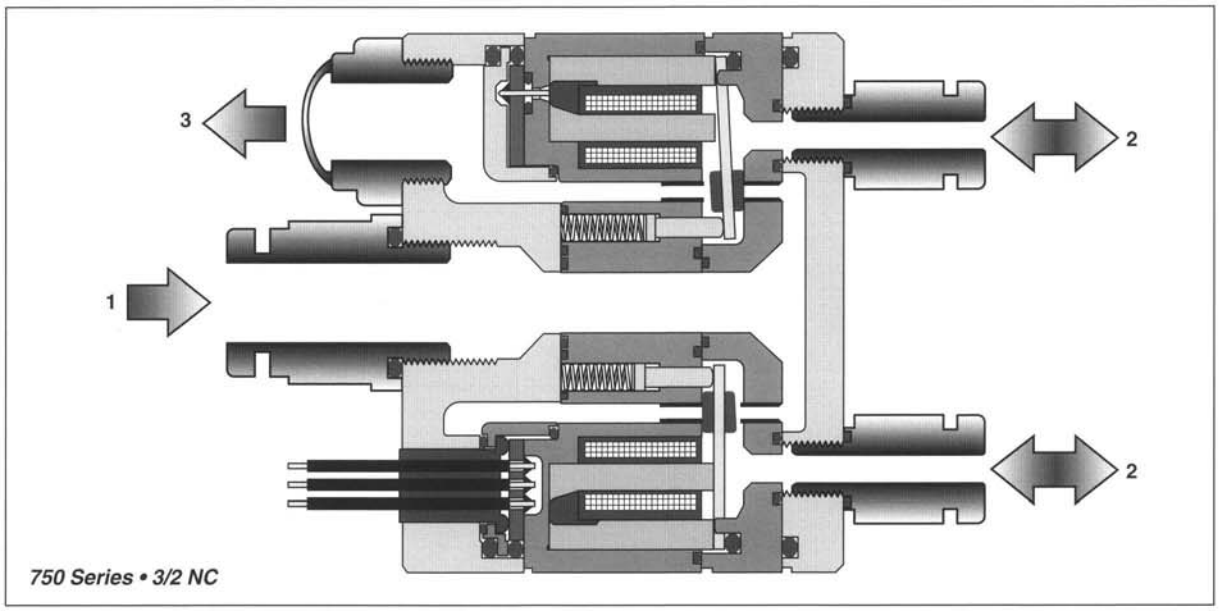


N.B. XX MODELS ARE CONTROLLED IN CURRENT

I 1 = 0.7 A	t 1 = 2 ms	I 2 = 0.3 A

SOLENOID VALVES 750 SERIES • 2/2 • 3/2

750 Series 2/2 and 2/3 encloses in a single body eight shutters in NC or NO configuration. The series modularity allows to have at disposal a single outlet or 2, 4, 8 independent outlets. All innovations offered by Matrix technology are present. Said characteristics couple manufacturing simplicity and ability of dynamic high-performances. Response times are of millisecond range, while operation life is over 500 million cycles. The Series includes the Vacuum versions designed for uses with vacuum technique. Due to the facility to be speed-up controlled, dynamic characteristics are even more improved: standard solenoid valves equipped with 24 VDC control present response times lower than 5 ms in opening and 2 ms in closing, with a maximum operation frequency 200 Hz. On the contrary, solenoid valves equipped with speed- up control present a response time both in opening and closing lower than 2 ms, with a maximum operation frequency 300 Hz.
Besides high-speed characteristics, solenoid valves 720 Series offer flow rate value to 100 ℓ/minute (ANR), with supply pressure from 0 to 8 bar.
For 750 multi-function series, a lot of accessories are available, such as IP 52 or IP 56 connectors, manifolds with different positions and speed-up driver boards.



750 Series • 3/2 NC

Advantages

- Compact dimension.
- High duct diameter and flow rate.
- Short response times.
- Insensitivity to frequency work and to vibrations.
- Low absorbed power.
- Precision, repetitiveness and flexibility.
- Long operating life.

Applications

- Process and precision instrumentation.
- Pressure and flow rate control devices.
- Positioning systems.
- Pilot system.
- Selection systems.
- Metering systems.
- Biomedical and measure sector.

Materials

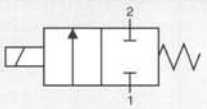
- Body in PPS.
- Flanges in Al. (in INOX if required).
- Seals in NBR. (shutters in HNBR if required).

751 • 2/2

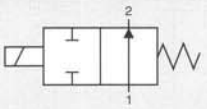
NC NO

CONTROL: DIRECT | PFM | PNM | PWM

N. 1 NC



N. 1 NO



GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)		
FILTRATION RATING	Min 40 micron		
TEMPERATURE	– 10 + 50°C (Standard version)		
RESPONSE TIME IN OPENING	12 / 24 < 7 ms	JJ < 5 ms	XX / KK < 2 ms
RESPONSE TIME IN CLOSING	12 / 24 < 3 ms	JJ < 2 ms	XX / KK < 2 ms
MAXIMUM FREQUENCY	100 Hz	200 Hz	300 Hz
WEIGHT	380 g		
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles		
IP RATING	IP 52 - IP 62 - IP 65		

IDENTIFICATION CODE

	H	X	7	5	1	1	0	2	C	2	24

OUTLETS

1	1 Outlet

FUNCTION

A	NO
C	NC

FLOW RATE (at 6 bar)

H	420 Nl/min
B	600 Nl/min
M	700 Nl/min (control tension JJ XX KK)

TYPE

2	2/2

VERSION

	Standard
H	HNBR Shutters

CONTROL TENSION

12	12 VDC ± 10 %	ED 100 %	1.4÷11.6W
24	24 VDC ± 10 %	ED 100 %	1.2÷10.0W
JJ	24 VDC ± 10 %	ED 100 %(1)	1.9÷15.2W
XX	Speed-up in current	ED 100 %(1)	—
KK	Speed-up in tension	ED 100 %(1)	—

(1) Only with Electronic Driver Boards PRB or UDB

No. ELECTRICAL CONTROLS

1	1 Control
2	2 Controls
4	4 Controls
8	8 Controls
C	4 Controls / Integrated diodes with commoni 0 V
D	8 Controls / Integrated diodes with commoni 0 V
F	4 Controls / Integrated diodes with common 12 / 24 V
G	8 Controls / Integrated diodes with common 12 / 24 V

OPERATING PRESSURE

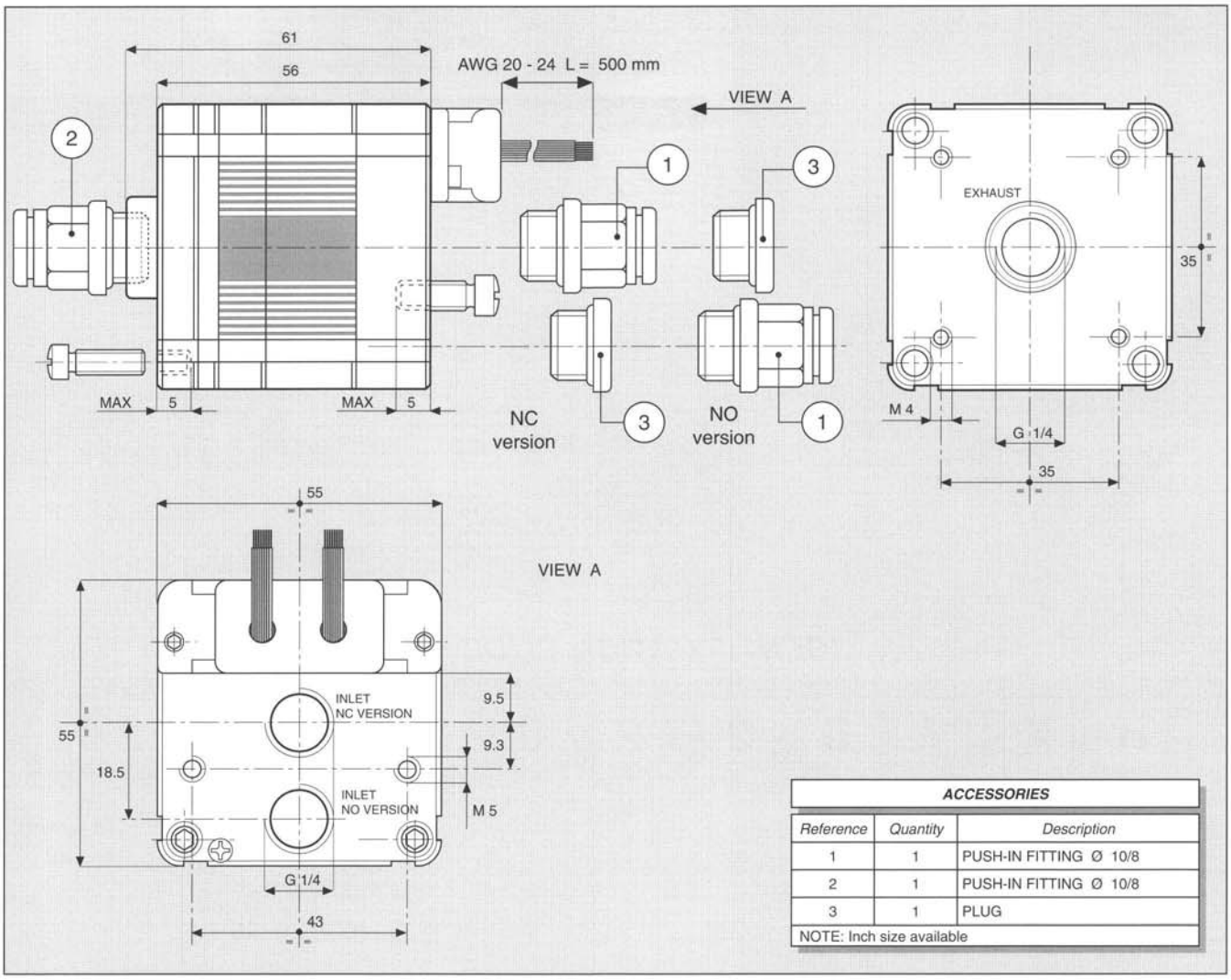
	RANGE	*MODELS*
1	0 - 4 bar	All
2	4 - 8 bar	All
3	0 - 8 bar	..... XX / KK
8	2 - 6 bar	All

PORT CONNECTION

0	Integrated cables IP 62 L = 500 mm
E	Presetting for Easy connection Easy IP 52 - IP 65 (only 4 and 8 controls)

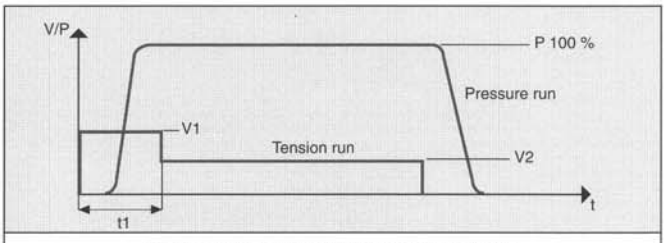
SPECIAL PROTECTIONS

	Only with EASY IP 65 port connection
M	Stainless steel (INOX) flanges
N	EPOX BLACK varnished flanges



ACCESSORIES		
Reference	*Quantity*	*Description*
1	1	PUSH-IN FITTING Ø 10/8
2	1	PUSH-IN FITTING Ø 10/8
3	1	PLUG
NOTE: Inch size available		

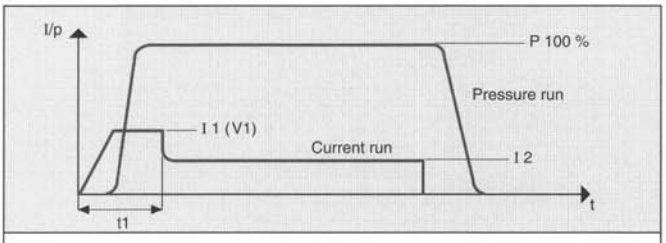
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC

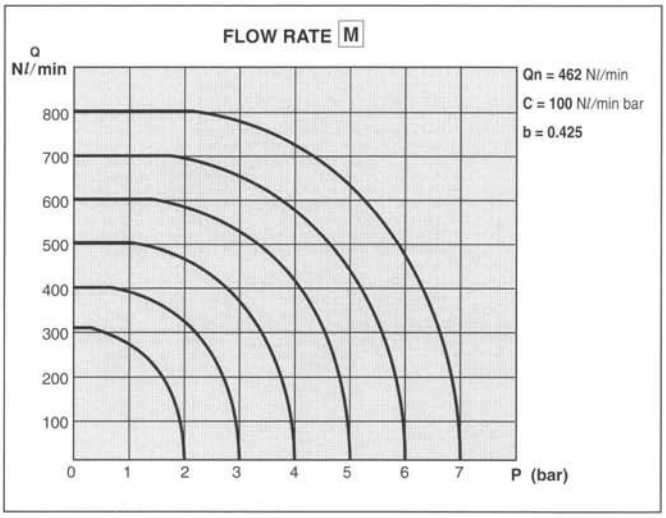
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

I 1 = 5.6 A	t 1 = 2 ms	I 2 = 2.4 A

FLOW RATE M

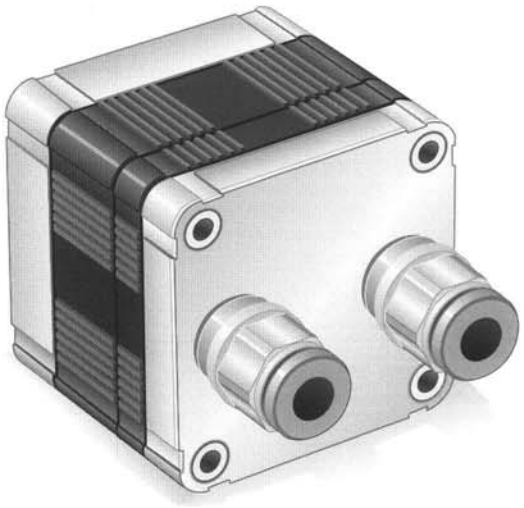


ELECTRICAL PORT CONNECTION

COLOUR	1 CONTROL	2 CONTROLS	4 CONTROLS	8 CONTROLS
BLACK	COMMON	COMMON	COMMON	COMMON
BROWN	—	1	1	1
RED	1	2	2	2
ORANGE	—	—	3	3
YELLOW	—	—	4	4
GREEN	—	—	—	5
BLUE	—	—	—	6
VIOLET	—	—	—	7
GREY	—	—	—	8

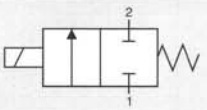
752 • 2/2

NC NO

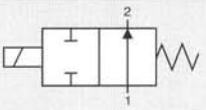


CONTROL: DIRECT | PFM | PNM | PWM

N. 2 NC



N. 2 NO



GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)		
FILTRATION RATING	Min 40 micron		
TEMPERATURE	– 10 + 50°C (Standard version)		
RESPONSE TIME IN OPENING	12 / 24 < 7 ms	JJ < 5 ms	XX / KK < 2 ms
RESPONSE TIME IN CLOSING	12 / 24 < 3 ms	JJ < 2 ms	XX / KK < 2 ms
MAXIMUM FREQUENCY	100 Hz	200 Hz	300 Hz
WEIGHT	330 g		
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles		
IP RATING	IP 52 - IP 62 - IP 65		

IDENTIFICATION CODE

	H	X	7	5	2	2	0	2	C	2	24

OUTLETS

2	2 Outlets

FUNCTION

A	NO
C	NC

FLOW RATE (at 6 bar)

H	200 Nl/min
B	310 Nl/min
M	360 Nl/min (control tension JJ XX KK)

TYPE

2	2/2

VERSION

	Standard
H	HNBR Shutters

CONTROL TENSION

12	12 VDC ± 10 %	ED 100 %	1.4 ÷ 5.8 W
24	24 VDC ± 10 %	ED 100 %	1.2 ÷ 5.0 W
JJ	24 VDC ± 10 %	ED 100 %(1)	1.9 ÷ 7.6 W
XX	Speed-up in current	ED 100 %(1)	—
KK	Speed-up in tension	ED 100 %(1)	—

(1) Only with Electronic Driver Boards PRB or UDB

No. ELECTRICAL CONTROLS

2	2 Controls
4	4 Controls
8	8 Controls
C	4 Controls / Integrated diodes with common 0 V
D	8 Controls / Integrated diodes with common 0 V
F	4 Controls / Integrated diodes with common 12 / 24 V
G	8 Controls / Integrated diodes with common 12 / 24 V

OPERATING PRESSURE

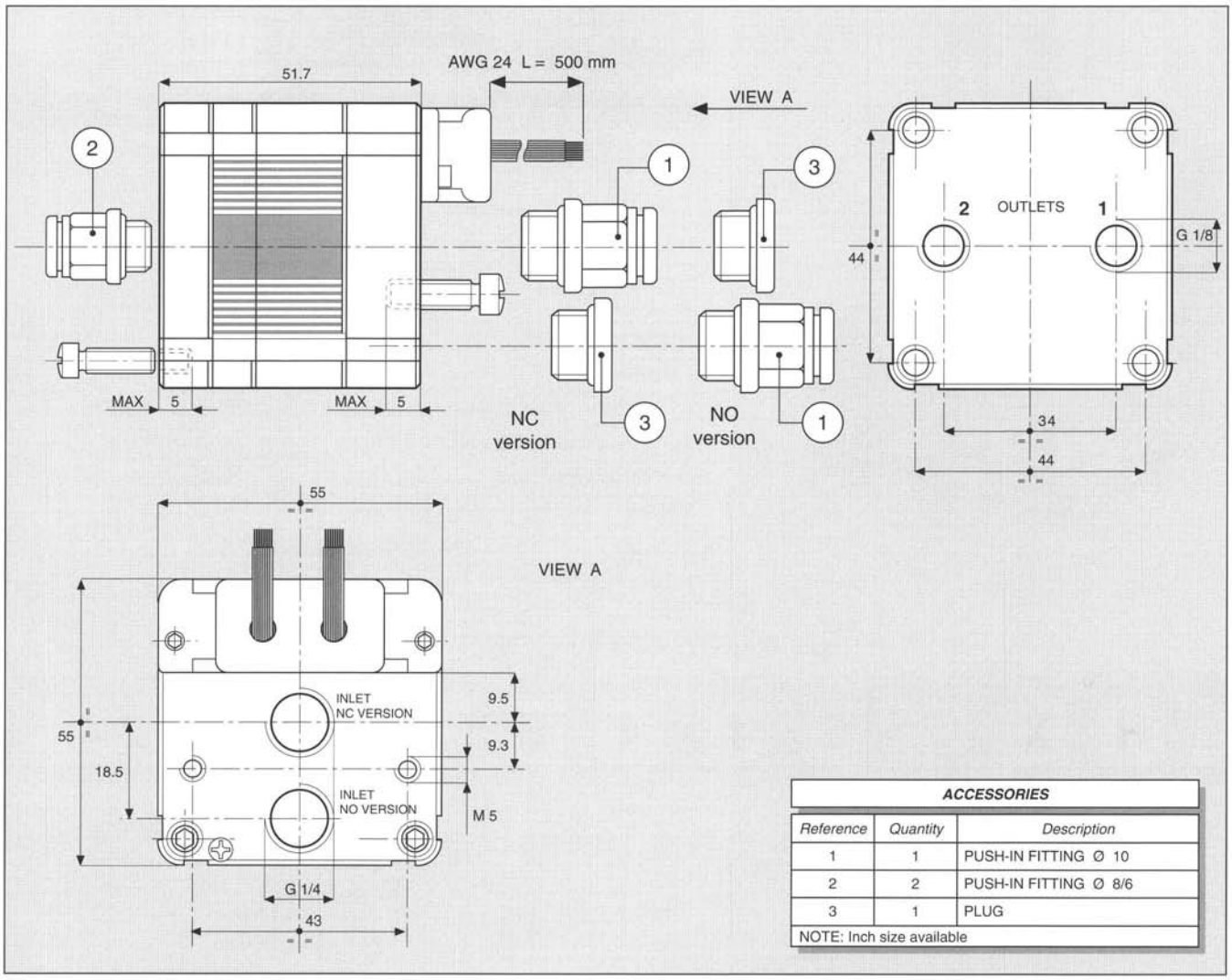
	RANGE	*MODELS*
1	0 - 4 bar	All
2	4 - 8 bar	All
3	0 - 8 bar	..... XX / KK
8	2 - 6 bar	All

PORT CONNECTION

0	Integrated cables IP 62 L = 500 mm
E	Presetting for Easy connection IP 52 - IP 65 (only 4 and 8 controls)

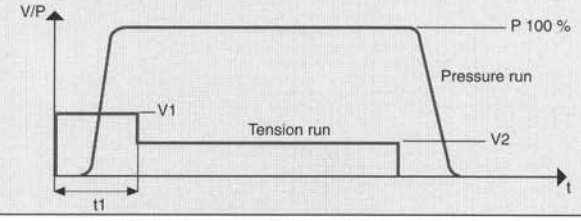
SPECIAL PROTECTIONS

	Only with EASY IP 65 port connection
M	Stainless steel (INOX) flanges
N	EPOX BLACK varnished flanges



ACCESSORIES		
Reference	*Quantity*	*Description*
1	1	PUSH-IN FITTING Ø 10
2	2	PUSH-IN FITTING Ø 8/6
3	1	PLUG
NOTE: Inch size available		

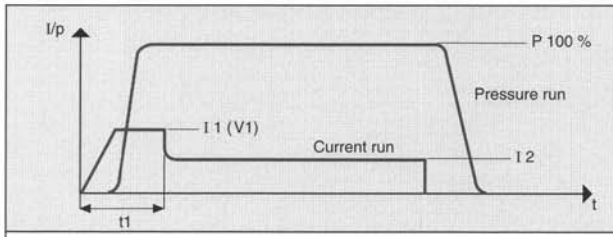
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC

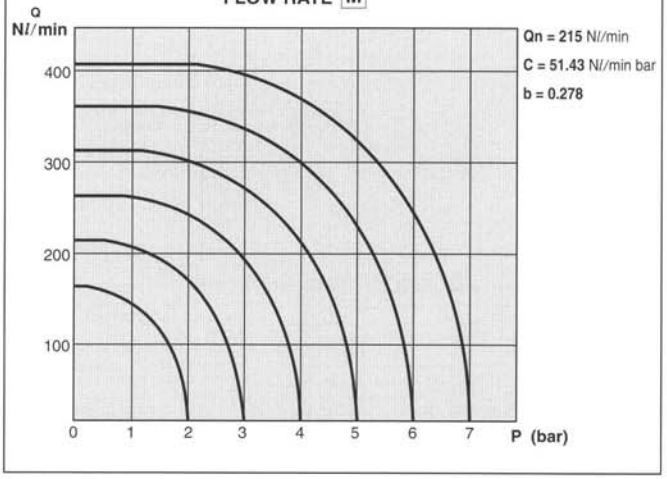
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

I 1 = 2.8 A	t 1 = 2 ms	I 2 = 1.2 A

FLOW RATE M

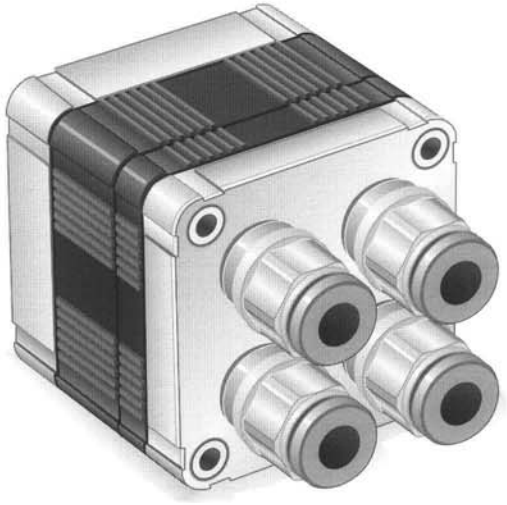


ELECTRICAL PORT CONNECTION

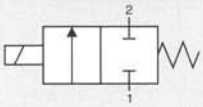
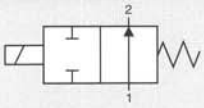
COLOUR	2 CONTROLS (SINGLE CABLES)	2 CONTROLS EASY CONNECTION IP 52	4 CONTROLS (OUTLET)	8 CONTROLS (OUTLET)
BLACK	COMMON	COMMON	COMMON	COMMON
BROWN	1	1	1 (1)	1 (1)
RED	2	—	2 (1)	2 (1)
ORANGE	—	2	3 (2)	3 (1)
YELLOW	—	—	4 (2)	4 (1)
GREEN	—	—	—	5 (2)
BLUE	—	—	—	6 (2)
VIOLET	—	—	—	7 (2)
GREY	—	—	—	8 (2)

754 • 2/2

NC NO



CONTROL: DIRECT | PFM | PNM | PWM

N. 4 NC	N. 4 NO
	

GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)		
FILTRATION RATING	Min 40 micron		
TEMPERATURE	– 10 + 50°C (Standard version)		
RESPONSE TIME IN OPENING	12 / 24 < 7 ms	JJ < 5 ms	XX / KK < 2 ms
RESPONSE TIME IN CLOSING	12 / 24 < 3 ms	JJ < 2 ms	XX / KK < 2 ms
MAXIMUM FREQUENCY	100 Hz	200 Hz	300 Hz
WEIGHT	340 g		
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles		
IP RATING	IP 52 - IP 62 - IP 65		

IDENTIFICATION CODE

	H	X	7	5	4	4	E	2	C	2	24

OUTLETS

4	4 Outlets

FUNCTION

A	NO
C	NC

FLOW RATE (at 6 bar)

H	100 Nl/min
B	160 Nl/min
M	200 Nl/min (control tension JJ XX KK)

TYPE

2	2/2

VERSION

	Standard
H	HNBR Shutters

CONTROL TENSION

12	12 VDC ± 10 %	ED 100 %	1.4 ÷ 2.9 W
24	24 VDC ± 10 %	ED 100 %	1.2 ÷ 2.5 W
JJ	24 VDC ± 10 %	ED 100 %(1)	1.9 ÷ 3.8 W
XX	Speed-up in current	ED 100 %(1)	—
KK	Speed-up in tension	ED 100 %(1)	—

(1) Only with Electronic Driver Boards PRB or UDB

No. ELECTRICAL CONTROLS

4	4 Controls
8	8 Controls
C	4 Controls / Integrated diodes with common 0 V
D	8 Controls / Integrated diodes with common 0 V
F	4 Controls / Integrated diodes with common 12 / 24 V
G	8 Controls / Integrated diodes with common 12 / 24 V

OPERATING PRESSURE

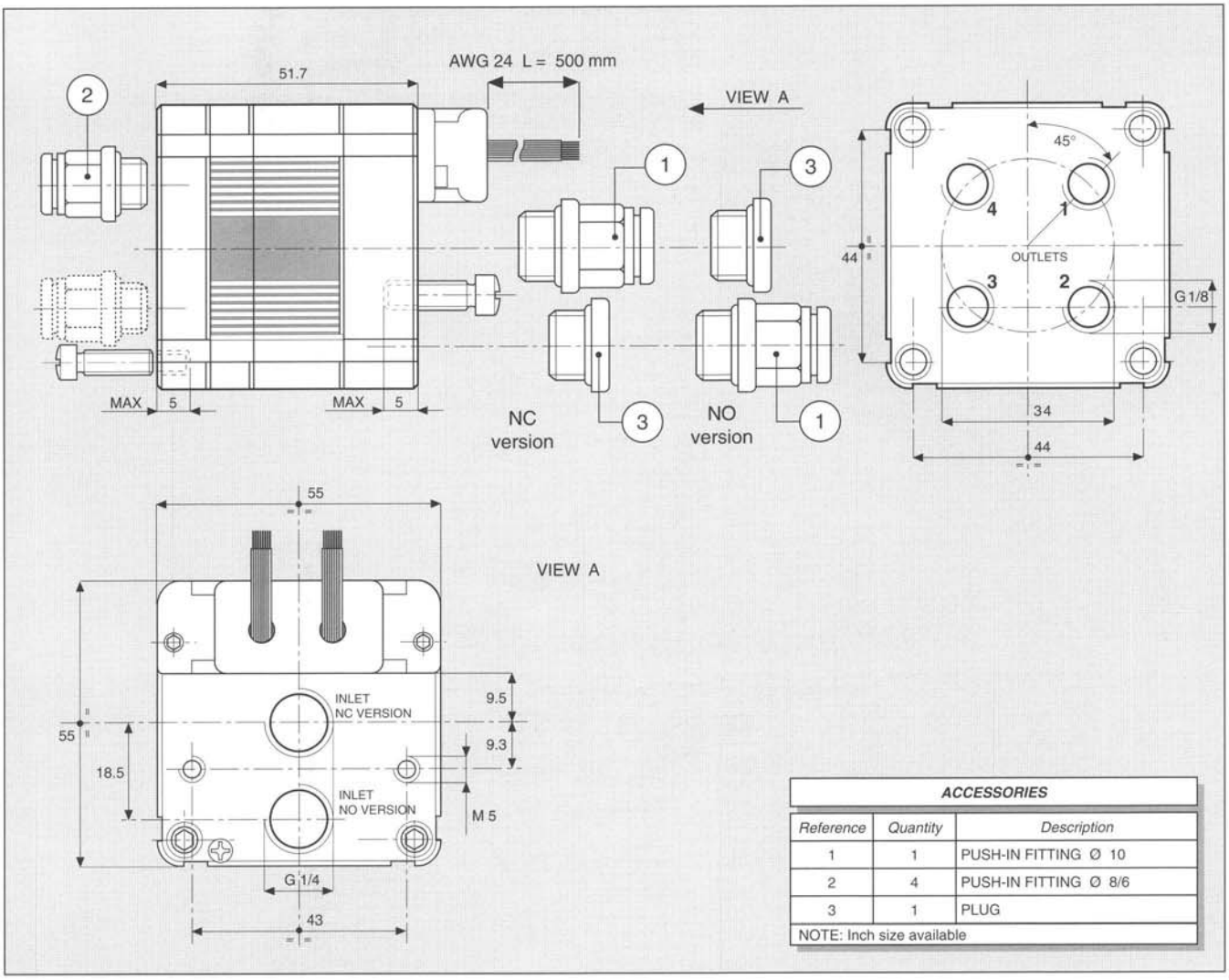
	RANGE	*MODELS*
1	0 - 4 bar	All
2	4 - 8 bar	All
3	0 - 8 bar	..... XX / KK
8	2 - 6 bar	All

PORT CONNECTION

0	Integrated cables IP 62 L = 500 mm
E	Presetting for Easy connection IP 52 - IP 65

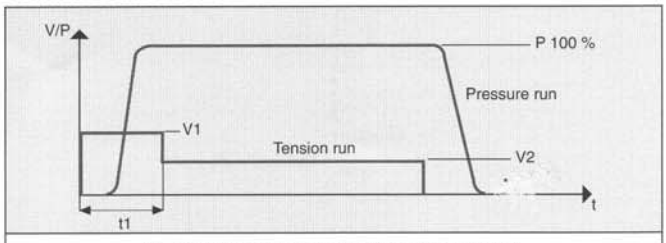
SPECIAL PROTECTIONS

Only with EASY IP 65 port connection	
M	Stainless steel (INOX) flanges
N	EPOX BLACK varnished flanges



ACCESSORIES		
Reference	*Quantity*	*Description*
1	1	PUSH-IN FITTING Ø 10
2	4	PUSH-IN FITTING Ø 8/6
3	1	PLUG
NOTE: Inch size available		

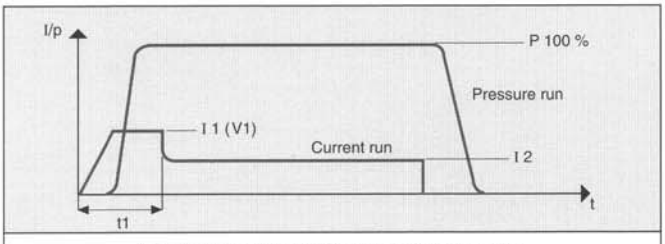
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC

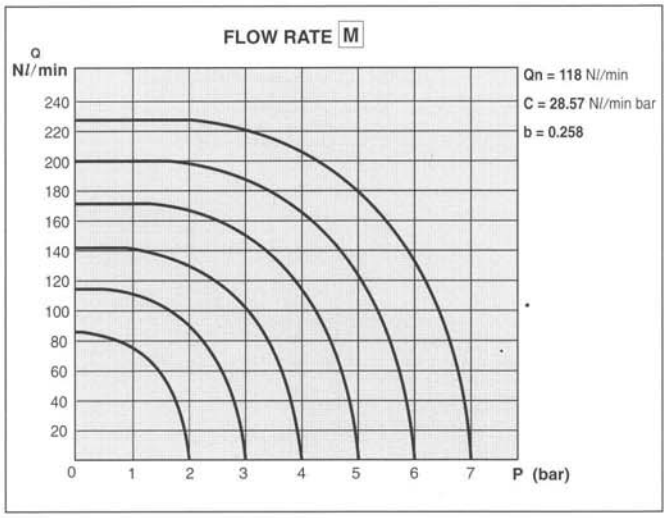
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

I 1 = 1.4 A	t 1 = 2 ms	I 2 = 0.6 A

FLOW RATE M



ELECTRICAL PORT CONNECTION

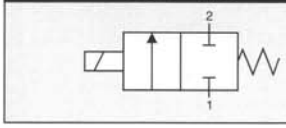
COLOUR	4 CONTROLS	8 CONTROLS (OUTLET)
BLACK	COMMON	COMMON
BROWN	1	1 (1)
RED	2	2 (1)
ORANGE	3	3 (2)
YELLOW	4	4 (2)
GREEN	—	5 (3)
BLUE	—	6 (3)
VIOLET	—	7 (4)
GREY	—	8 (4)

758 • 2/2

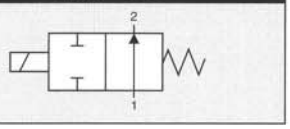
NC **NO**

CONTROL: DIRECT | PFM | PWM

N. 8 NC



N. 8 NO



GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)		
FILTRATION RATING	Min 40 micron		
TEMPERATURE	– 10 + 50°C (Standard version)		
RESPONSE TIME IN OPENING	12 / 24 < 7 ms	JJ < 5 ms	XX / KK < 2 ms
RESPONSE TIME IN CLOSING	12 / 24 < 3 ms	JJ < 2 ms	XX / KK < 2 ms
MAXIMUM FREQUENCY	100 Hz	200 Hz	300 Hz
WEIGHT	350 g		
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles		
IP RATING	IP 52 - IP 62 - IP 65		

IDENTIFICATION CODE

	H	X	7	5	8	8	E	2	C	2	24

OUTLETS

8	8 Outlet

FUNCTION

A	NO
C	NC

FLOW RATE (at 6 bar)

H	50 Nl/min
B	80 Nl/min
M	100 Nl/min (control tension JJ XX KK)

TYPE

2	2/2

VERSION

	Standard
H	NBR Shutters

CONTROL TENSION

12	12 VDC ± 10 %	ED 100 %	1.4 W
24	24 VDC ± 10 %	ED 100 %	1.2 W
JJ	24 VDC ± 10 %	ED 100 %(1)	1.9 W
XX	Speed-up in current	ED 100 %(1)	—
KK	Speed-up in tension	ED 100 %(1)	—

(1) Only with Electronic Driver Boards PRB or UDB

No. ELECTRICAL CONTROLS

8	8 Controls
D	8 Controls / Integrated diodes with common 0 V
G	8 Controls / Integrated diodes with common 12 / 24 V

OPERATING PRESSURE

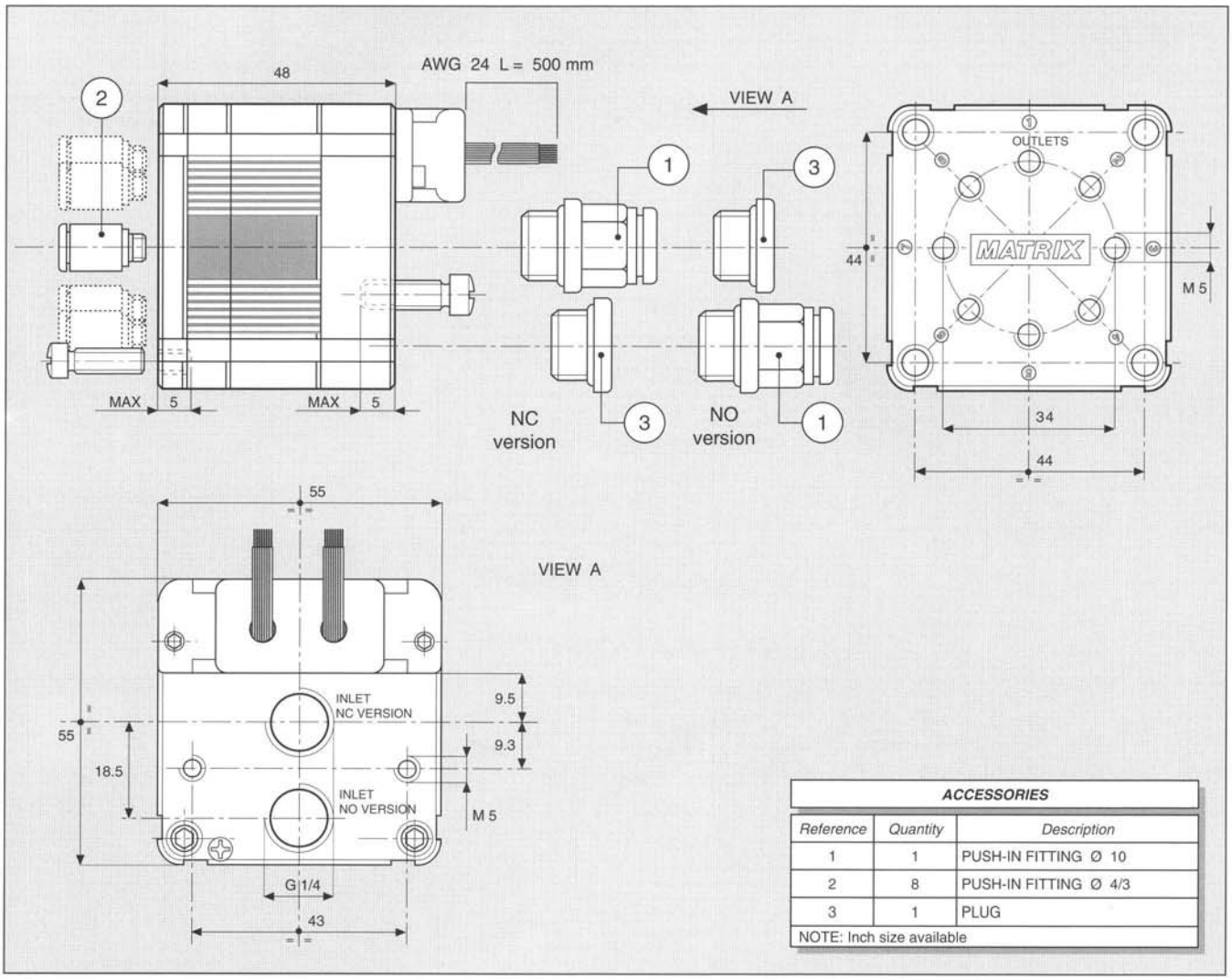
	RANGE	*MODELS*
1	0 - 4 bar	All
2	4 - 8 bar	All
3	0 - 8 bar	..... XX / KK
8	2 - 6 bar	All

PORT CONNECTION

0	Integrated cables IP 62 L = 500 mm
E	Presetting for Easy connection IP 52 - IP 65

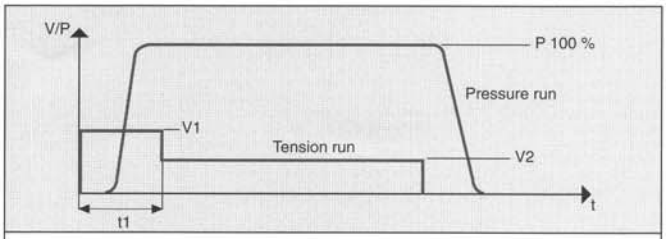
SPECIAL PROTECTIONS

Only with EASY IP 65 port connection	
M	Stainless steel (INOX) flanges
N	EPOX BLACK varnished flanges



ACCESSORIES		
Reference	*Quantity*	*Description*
1	1	PUSH-IN FITTING Ø 10
2	8	PUSH-IN FITTING Ø 4/3
3	1	PLUG
NOTE: Inch size available		

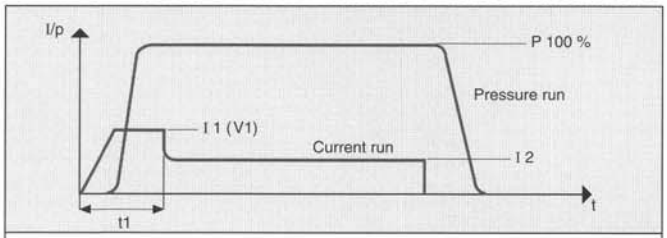
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC

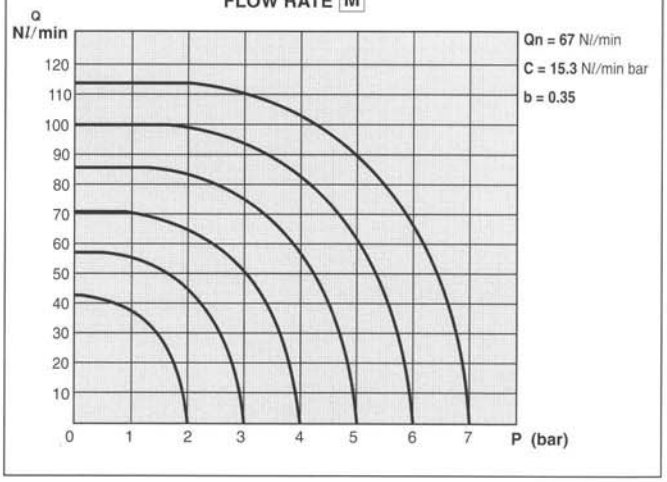
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

I 1 = 0.7 A	t 1 = 2 ms	I 2 = 0.3 A

FLOW RATE M



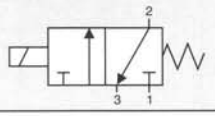
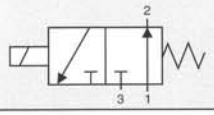
ELECTRICAL PORT CONNECTION

COLOUR	8 CONTROLS
BLACK	COMMON
BROWN	1
RED	2
ORANGE	3
YELLOW	4
GREEN	5
BLUE	6
VIOLET	7
GREY	8

751 • 3/2

NC **NO**

CONTROL: DIRECT

N. 1 NC	N. 1 NO
	

GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)		
FILTRATION RATING	Min 40 micron		
TEMPERATURE	– 10 + 50°C (Standard version)		
RESPONSE TIME IN OPENING	12 / 24 < 7 ms	JJ < 5 ms	XX / KK < 2 ms
RESPONSE TIME IN CLOSING	12 / 24 < 3 ms	JJ < 2 ms	XX / KK < 2 ms
MAXIMUM FREQUENCY	100 Hz	200 Hz	300 Hz
WEIGHT	380 g		
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles		
IP RATING	IP 62		

IDENTIFICATION CODE

	H	X	7	5	1	1	0	2	C	3	2 4

OUTLETS

1	1 Outlet

FUNCTION

A	NO
C	NC

FLOW RATE (at 6 bar)

H	420 Nl/min
B	600 Nl/min
M	700 Nl/min (control tension JJ XX KK)

TYPE

3	3/2

VERSION

	Standard
H	HNBR Shutters

CONTROL TENSION

12	12 VDC ± 10 %	ED 100 %	11.6 W
24	24 VDC ± 10 %	ED 100 %	10.0 W
JJ	24 VDC ± 10 %	ED 100 % (1)	15.2 W
XX	Speed-up in current	ED 100 % (1)	—
KK	Speed-up in tension	ED 100 % (1)	—

(1) Only with Electronic Driver Boards PRB or UDB

No. ELECTRICAL CONTROLS

1	1 Control

PRESSIONE DI ESERCIZIO

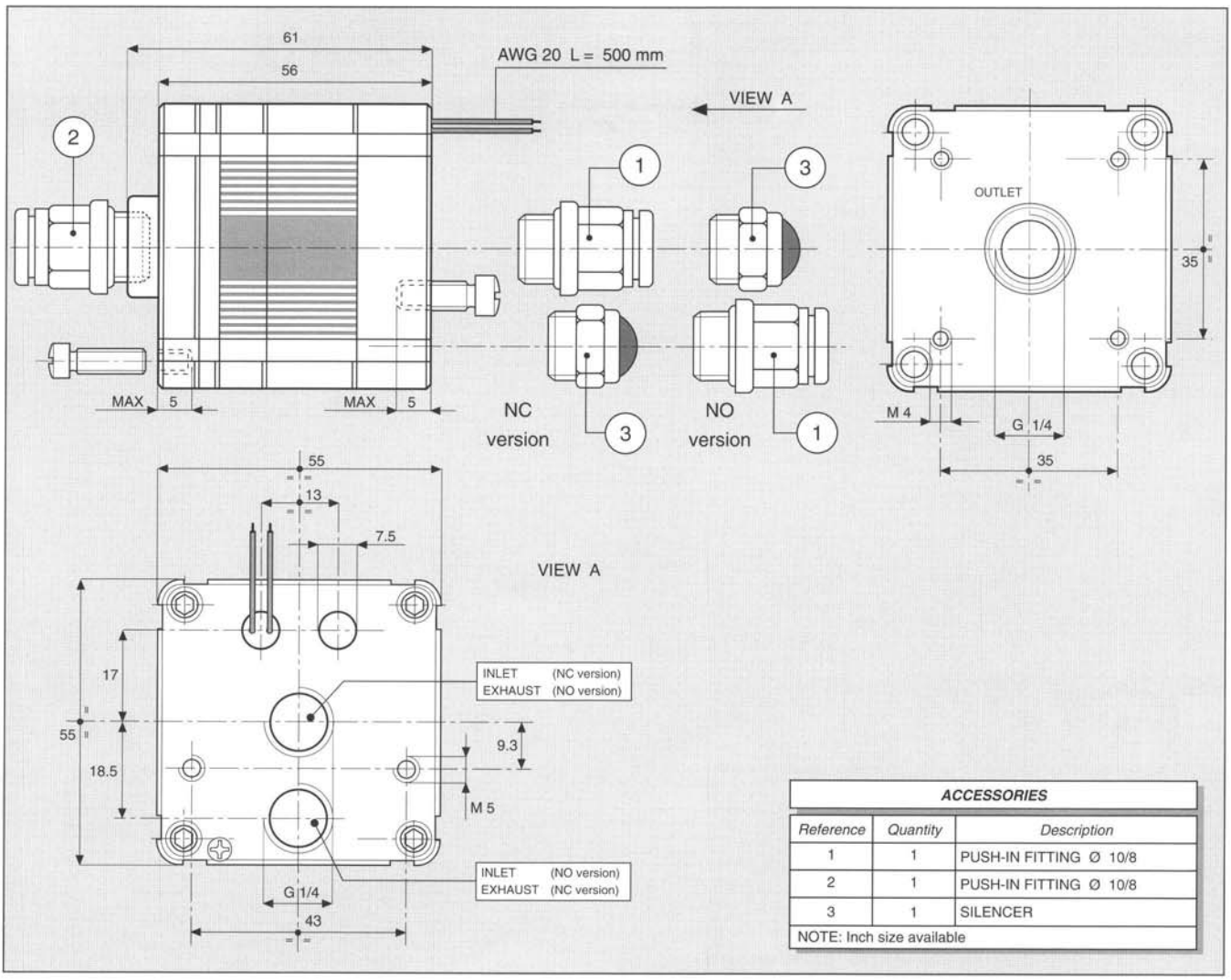
	RANGE	*MODELS*
1	0 - 4 bar	All
2	4 - 8 bar	All
3	0 - 8 bar	..... XX / KK
8	2 - 6 bar	All

PORT CONNECTION

0	Integrated cables IP 62 L = 500 mm

SPECIAL PROTECTIONS

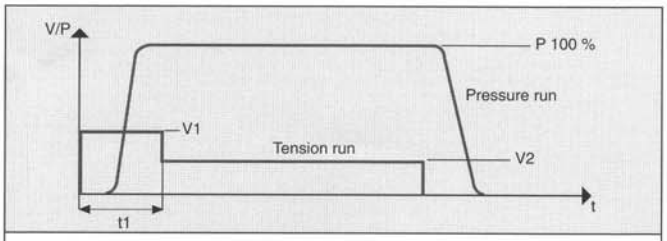
M	Stainless steel (INOX) flanges
N	EPOX BLACK varnished flanges



ACCESSORIES

Reference	*Quantity*	*Description*
1	1	PUSH-IN FITTING Ø 10/8
2	1	PUSH-IN FITTING Ø 10/8
3	1	SILENCER
NOTE: Inch size available		

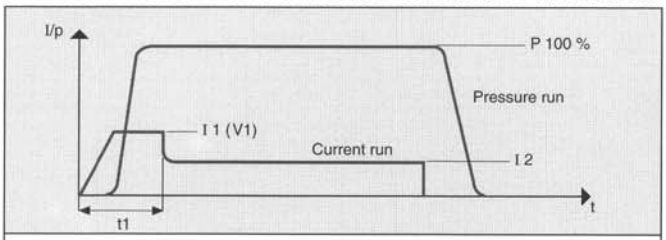
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC

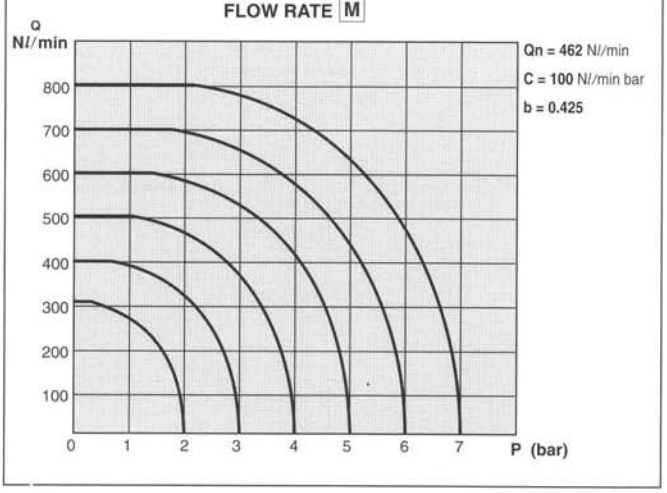
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

I 1 = 5.6 A	t 1 = 2 ms	I 2 = 2.4 A

FLOW RATE M

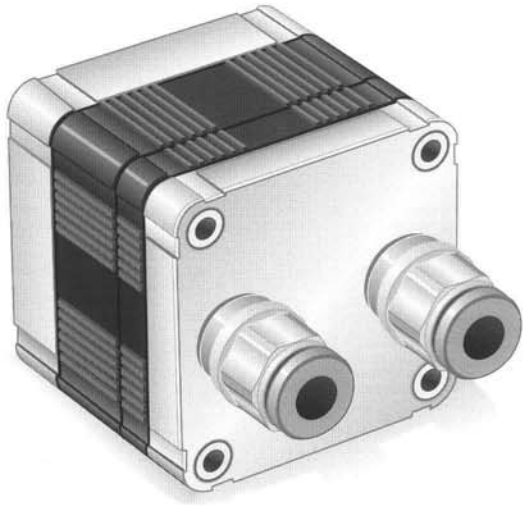


ELECTRICAL PORT CONNECTION

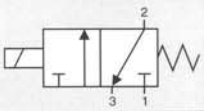
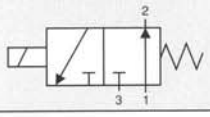
COLORE	1 CONTROL
BLACK	COMMON
BROWN	1

752 • 3/2

NC NO



CONTROL: DIRECT

N. 2 NC	N. 2 NO
	

GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)		
FILTRATION RATING	Min 40 micron		
TEMPERATURE	– 10 + 50°C (Standard version)		
RESPONSE TIME IN OPENING	12 / 24 < 7 ms	JJ < 5 ms	XX / KK < 2 ms
RESPONSE TIME IN CLOSING	12 / 24 < 3 ms	JJ < 2 ms	XX / KK < 2 ms
MAXIMUM FREQUENCY	100 Hz	200 Hz	300 Hz
WEIGHT	330 g		
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles		
IP RATING	IP 52 - IP 62		

IDENTIFICATION CODE

	H	X	7	5	2	2	0	2	C	3	24

OUTLETS

2	2 Outlets

FUNCTION

A	NO
C	NC

FLOW RATE (at 6 bar)

H	200 Nl/min
B	310 Nl/min
M	360 Nl/min (control tension JJ XX KK)

TYPE

3	3/2

VERSION

	Standard
H	HNBR Shutters

CONTROL TENSION

12	12 VDC ± 10 %	ED 100 %	5.8 W
24	24 VDC ± 10 %	ED 100 %	5.0 W
JJ	24 VDC ± 10 %	ED 100 % (1)	7.6 W
XX	Speed-up in current	ED 100 % (1)	—
KK	Speed-up in tension	ED 100 % (1)	—

(1) Only with Electronic Driver Boards PRB or UDB

No. ELECTRICAL CONTROLS

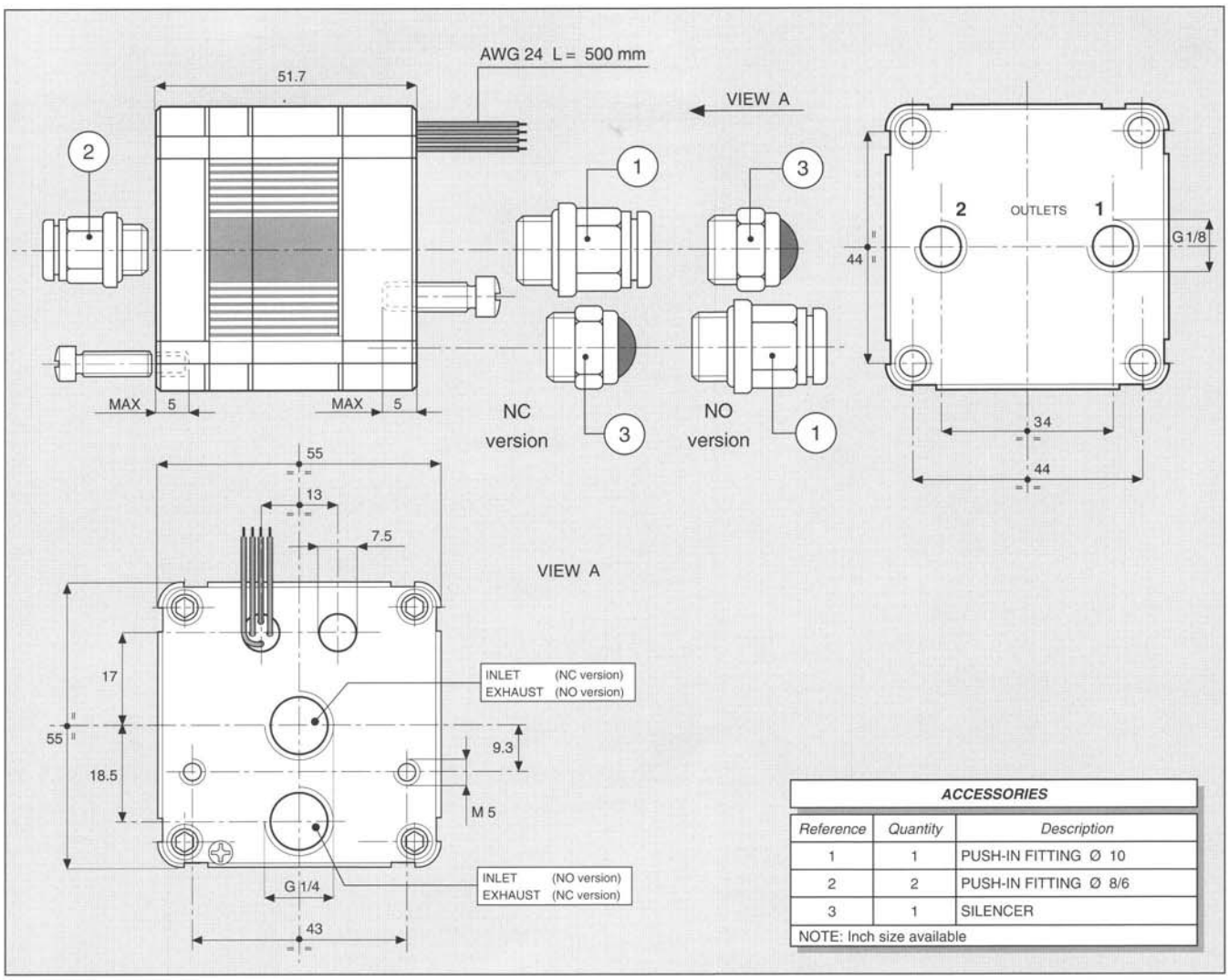
2	2 Controls

OPERATING PRESSURE

	RANGE	*MODELS*
1	0 - 4 bar	All
2	4 - 8 bar	All
3	0 - 8 bar	..... XX / KK
8	2 - 6 bar	All

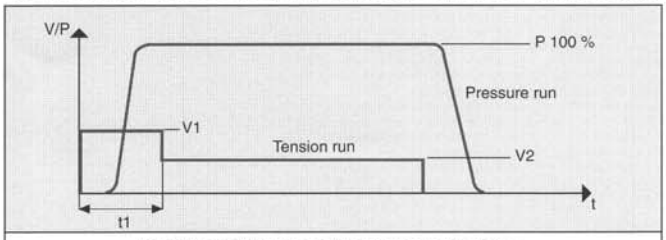
PORT CONNECTION

0	Integrated cables IP 62 L = 500 mm
E	Presetting for Easy connection IP 52



ACCESSORIES		
Reference	*Quantity*	*Description*
1	1	PUSH-IN FITTING Ø 10
2	2	PUSH-IN FITTING Ø 8/6
3	1	SILENCER
NOTE: Inch size available		

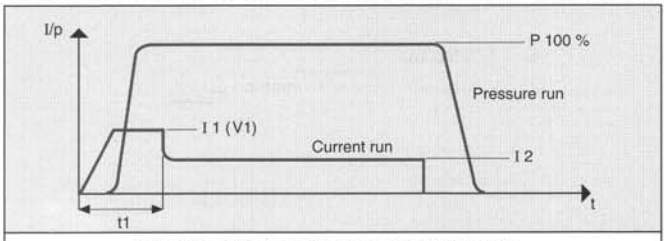
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC

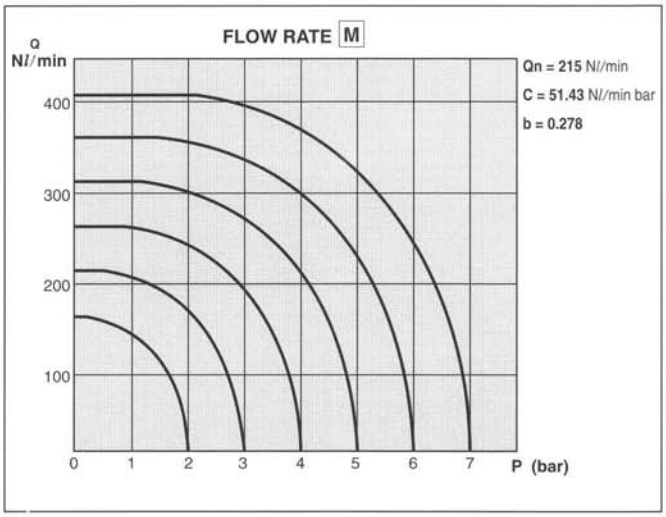
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

I 1 = 2.8 A	t 1 = 2 ms	I 2 = 1.2 A

FLOW RATE M

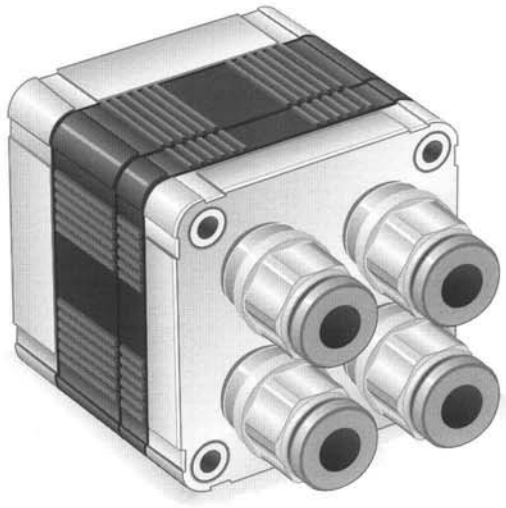


ELECTRICAL PORT CONNECTION

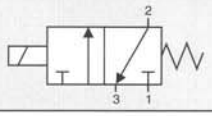
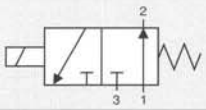
COLOUR	2 CONTROLS (SINGLE CABLES)	2 CONTROLS EASY CONNCTION IP 52
BLACK	COMMON	COMMON
BROWN	1	1
RED	2	—
ORANGE	—	2

754 • 3/2

NC NO



CONTROL: DIRECT

N. 4 NC	N. 4 NO
	

GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)		
FILTRATION RATING	Min 40 micron		
TEMPERATURE	– 10 + 50°C (Standard version)		
RESPONSE TIME IN OPENING	12 / 24 < 7 ms	JJ < 5 ms	XX / KK < 2 ms
RESPONSE TIME IN CLOSING	12 / 24 < 3 ms	JJ < 2 ms	XX / KK < 2 ms
MAXIMUM FREQUENCY	100 Hz	200 Hz	300 Hz
WEIGHT	340 g		
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles		
IP RATING	IP 52 - IP 62 - IP 65		

IDENTIFICATION CODE

	H	X	7	5	4	4	E	2	C	3	24

OUTLETS

4	4 Outlet

FUNCTION

A	NO
C	NC

FLOW RATE (at 6 bar)

H	100 Nl/min
B	160 Nl/min
M	200 Nl/min (control tension JJ XX KK)

TYPE

3	3/2

VERSION

	Standard
H	HNBR Shutters

CONTROL TENSION

12	12 VDC ± 10 %	ED 100 %	2.9 W
24	24 VDC ± 10 %	ED 100 %	2.5 W
JJ	24 VDC ± 10 %	ED 100 %(1)	3.8 W
XX	Speed-up in current	ED 100 %(1)	—
KK	Speed-up in tension	ED 100 %(1)	—

(1) Only with Electronic Driver Boards PRB or UDB

No. ELECTRICAL CONTROLS

4	4 Controls
C	4 Controls / Integrated diodes with common 0 V
F	4 Controls / Integrated diodes with common 12 / 24 V

PRESSIONE DI ESERCIZIO

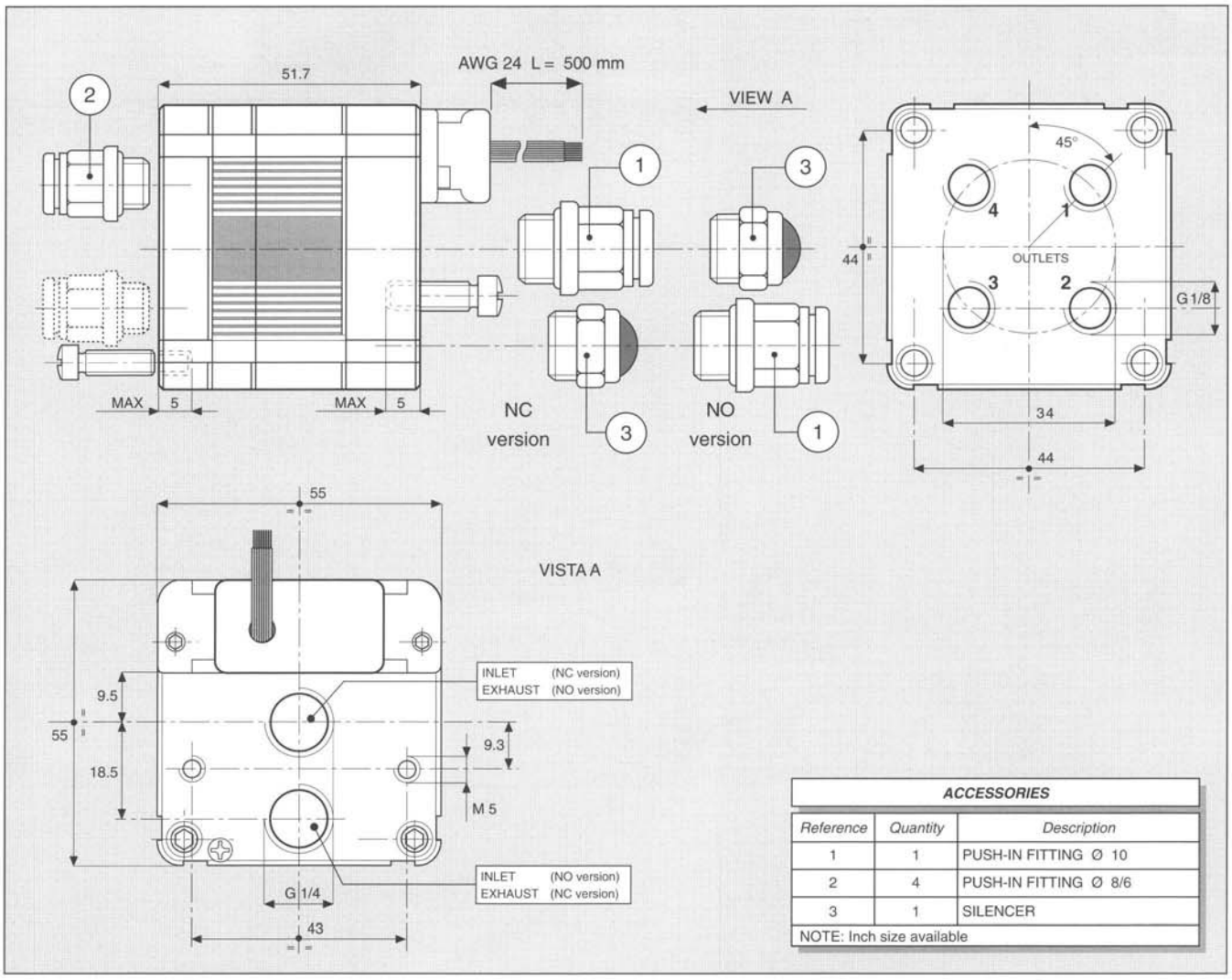
	RANGE	*MODELS*
1	0 - 4 bar	All
2	4 - 8 bar	All
3	0 - 8 bar	..... XX / KK
8	2 - 6 bar	All

PORT CONNECTION

0	Integrated cables IP 62 L = 500 mm
E	Presetting for Easy connection IP 52 - IP 65

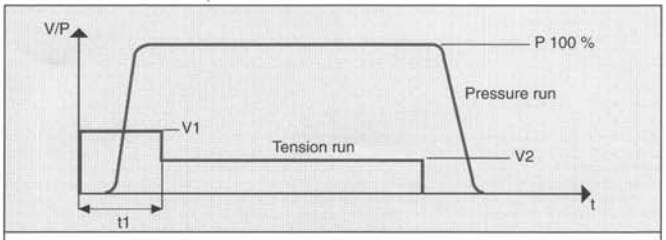
SPECIAL PROTECTIONS

	Only with EASY IP 65 port connection
M	Stainless steel (INOX) flanges
N	EPOX BLACK varnished flanges



ACCESSORIES		
Reference	*Quantity*	*Description*
1	1	PUSH-IN FITTING Ø 10
2	4	PUSH-IN FITTING Ø 8/6
3	1	SILENCER
NOTE: Inch size available		

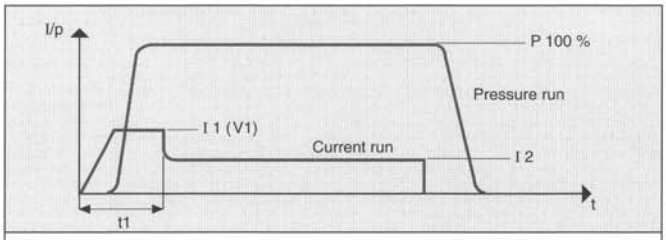
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC

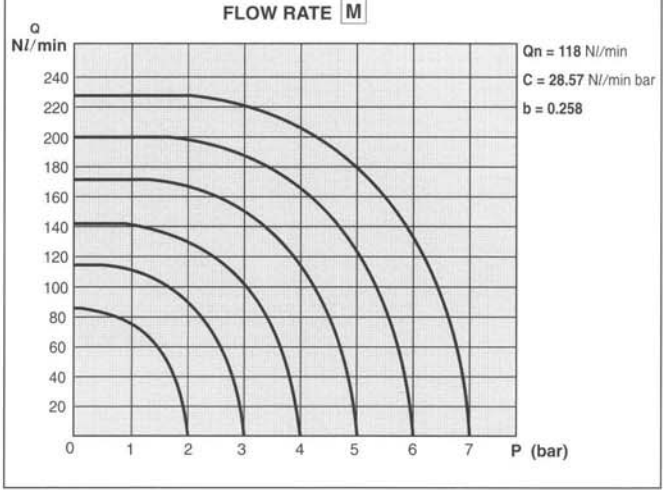
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

I 1 = 1.4 A	t 1 = 2 ms	I 2 = 0.6 A

FLOW RATE M



ELECTRICAL PORT CONNECTION

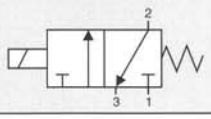
COLOUR	4 CONTROLS
BLACK	COMMON
BROWN	1
RED	2
ORANGE	3
YELLOW	4

758 • 3/2

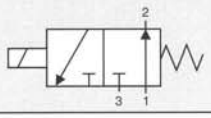
NC NO

CONTROL: DIRECT

N. 8 NC



N. 8 NO



GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)		
FILTRATION RATING	Min 40 micron		
TEMPERATURE	– 10 + 50°C (Standard version)		
RESPONSE TIME IN OPENING	12 / 24 < 7 ms	JJ < 5 ms	XX / KK < 2 ms
RESPONSE TIME IN CLOSING	12 / 24 < 3 ms	JJ < 2 ms	XX / KK < 2 ms
MAXIMUM FREQUENCY	100 Hz	200 Hz	300 Hz
WEIGHT	350 g		
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles		
IP RATING	IP 52 - IP 62 - IP 65		

IDENTIFICATION CODE

	H	X	7	5	8	8	E	2	C	3	24

OUTLETS

8	8 Outlet

FUNCTION

A	NO
C	NC

FLOW RATE (at 6 bar)

H	50 Nl/min
B	80 Nl/min
M	100 Nl/min (control tension JJ XX KK)

TYPE

3	3/2

VERSION

	Standard
H	HNBR Shutters

CONTROL TENSION

12	12 VDC ± 10 %	ED 100 %	1.4 W
24	24 VDC ± 10 %	ED 100 %	1.2 W
JJ	24 VDC ± 10 %	ED 100 % (1)	1.9 W
XX	Speed-up in current	ED 100 % (1)	—
KK	Speed-up in tension	ED 100 % (1)	—

(1) Only with Electronic Driver Boards PRB or UDB

No. ELECTRICAL CONTROLS

8	8 Controls
D	8 Controls / Integrated diodes with common 0 V
G	8 Controls / Integrated diodes with common 12 / 24 V

OPERATING PRESSURE

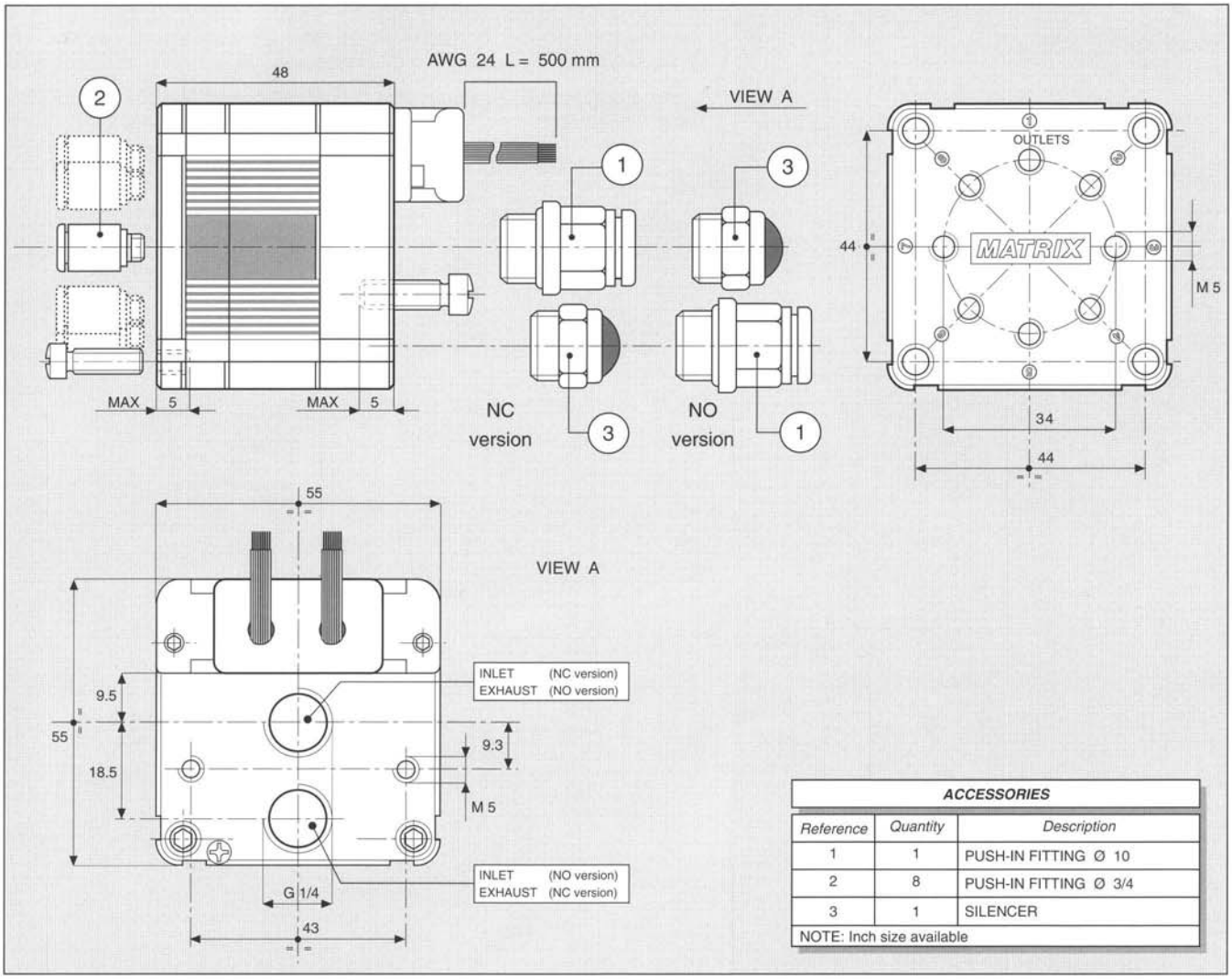
	RANGE	*MODELS*
1	0 - 4 bar	All
2	4 - 8 bar	All
3	0 - 8 bar	..... XX / KK
8	2 - 6 bar	All

PORT CONNECTION

0	Integrated cables IP 62 L = 500 mm
E	Presetting for Easy connection IP 52 - IP 65

SPECIAL PROTECTIONS

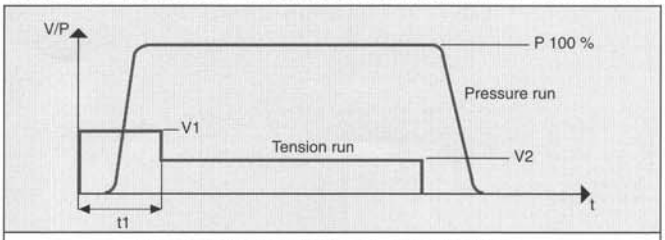
	Only with EASY IP 65 port connection
M	Stainless steel (INOX) flanges
N	EPOX BLACK varnished flanges



ACCESSORIES

Reference	*Quantity*	*Description*
1	1	PUSH-IN FITTING Ø 10
2	8	PUSH-IN FITTING Ø 3/4
3	1	SILENCER
NOTE: Inch size available		

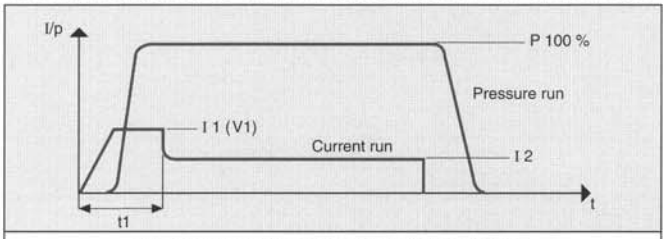
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC

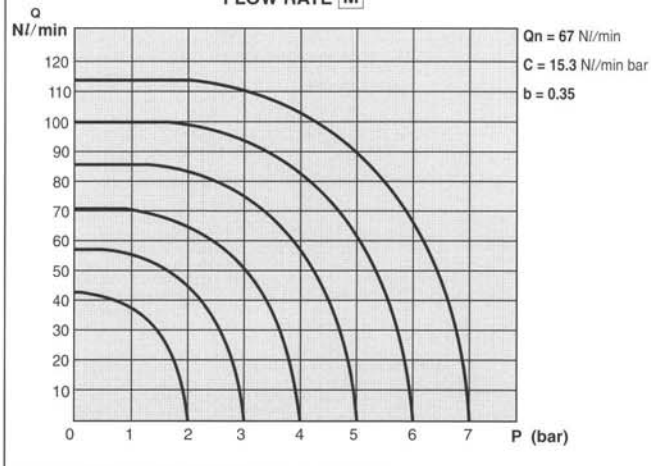
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

I 1 = 0.7 A	t 1 = 2 ms	I 2 = 0.3 A

FLOW RATE M

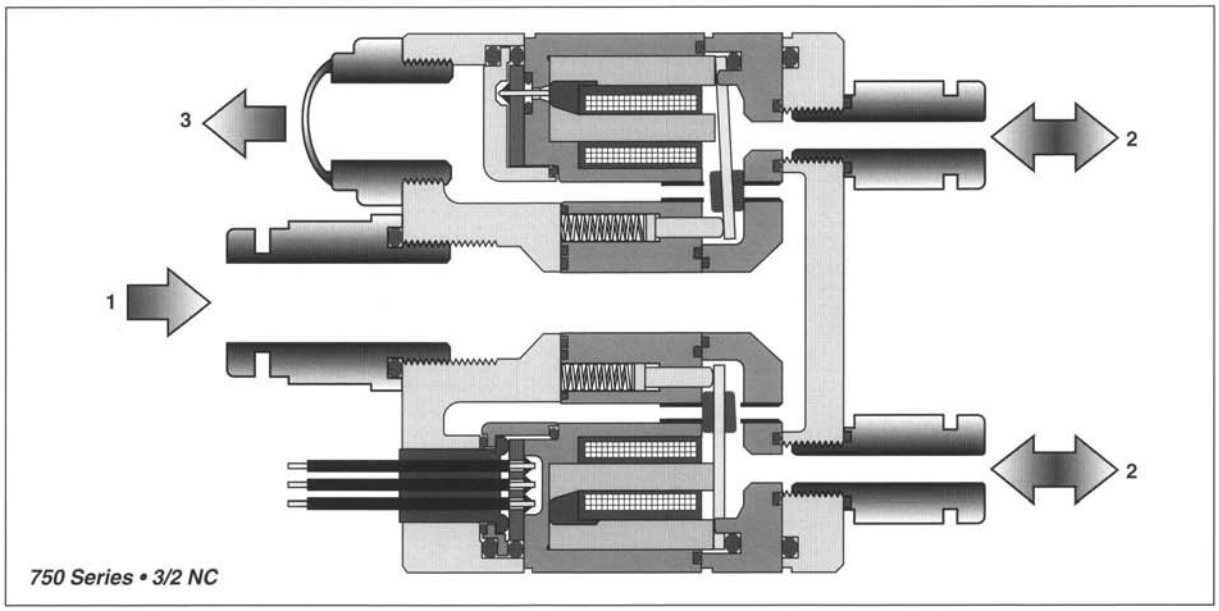


ELECTRICAL PORT CONNECTION

COLOUR	8 CONTROLS
BLACK	COMMON
BROWN	1
RED	2
ORANGE	3
YELLOW	4
GREEN	5
BLUE	6
VIOLET	7
GREY	8

SOLENOID VALVES 750 SERIES • 2/2 • 3/2

750 Series 2/2 and 2/3 encloses in a single body eight shutters in NC or NO configuration. The series modularity allows to have at disposal a single outlet or 2, 4, 8 independent outlets. All innovations offered by Matrix technology are present. Said characteristics couple manufacturing simplicity and ability of dynamic high-performances. Response times are of millisecond range, while operation life is over 500 million cycles. The Series includes the Vacuum versions designed for uses with vacuum technique. Due to the facility to be speed-up controlled, dynamic characteristics are even more improved: standard solenoid valves equipped with 24 VDC control present response times lower than 5 ms in opening and 2 ms in closing, with a maximum operation frequency 200 Hz. On the contrary, solenoid valves equipped with speed- up control present a response time both in opening and closing lower than 2 ms, with a maximum operation frequency 300 Hz.
Besides high-speed characteristics, solenoid valves 720 Series offer flow rate value to 100 ℓ/minute (ANR), with supply pressure from 0 to 8 bar.
For 750 multi-function series, a lot of accessories are available, such as IP 52 or IP 56 connectors, manifolds with different positions and speed-up driver boards.



750 Series • 3/2 NC

Advantages

- Compact dimension.
- High duct diameter and flow rate.
- Short response times.
- Insensitivity to frequency work and to vibrations.
- Low absorbed power.
- Precision, repetitiveness and flexibility.
- Long operating life.

Applications

- Process and precision instrumentation.
- Pressure and flow rate control devices.
- Positioning systems.
- Pilot system.
- Selection systems.
- Metering systems.
- Biomedical and measure sector.

Materials

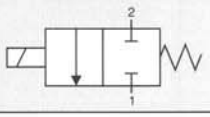
- Body in PPS.
- Flanges in Al. (in INOX if required).
- Seals in NBR. (shutters in HNBR if required).

751 VACUUM • 2/2

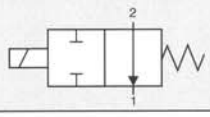
NC NO

CONTROL: DIRECT | PFM | PNM | PWM

N. 1 NC



N. 1 NO



GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)		
FILTRATION RATING	Min 40 micron		
TEMPERATURE	– 10 + 50°C (Standard version)		
RESPONSE TIME IN OPENING	12 / 24 < 7 ms	JJ < 5 ms	XX / KK < 2 ms
RESPONSE TIME IN CLOSING	12 / 24 < 3 ms	JJ < 2 ms	XX / KK < 2 ms
MAXIMUM FREQUENCY	100 Hz	200 Hz	300 Hz
WEIGHT	380 g		
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles		
IP RATING	IP 52 - IP 62 - IP 65		

IDENTIFICATION CODE

	H	X	7	5	1	1	0	V	C	2	24

OUTLETS

1	Outlet

FUNCTION

A	NO
C	NC

ORIFICES

H	Ø eq = 2.5 mm
B	Ø eq = 3.6 mm
M	Ø eq = 4.2 mm (control tension JJ XX KK)

TYPE

2	2/2

VERSION

	Standard
H	HNBR Shutters

CONTROL TENSION

12	12 VDC ± 10 %	ED 100 %	1.4÷11.6W
24	24 VDC ± 10 %	ED 100 %	1.2÷10.0W
JJ	24 VDC ± 10 %	ED 100 %(1)	1.9÷15.2W
XX	Speed-up in current	ED 100 %(1)	—
KK	Speed-up in tension	ED 100 %(1)	—

(1) Only with Electronic Driver Boards PRB or UDB

No. ELECTRICAL CONTROLS

1	1 Control
2	2 Controls
4	4 Controls
8	8 Controls
C	4 Controls / Integrated diodes with common 0 V
D	8 Controls / Integrated diodes with common 0 V
F	4 Controls / Integrated diodes with common 12 / 24 V
G	8 Controls / Integrated diodes with common 12 / 24 V

OPERATING PRESSURE

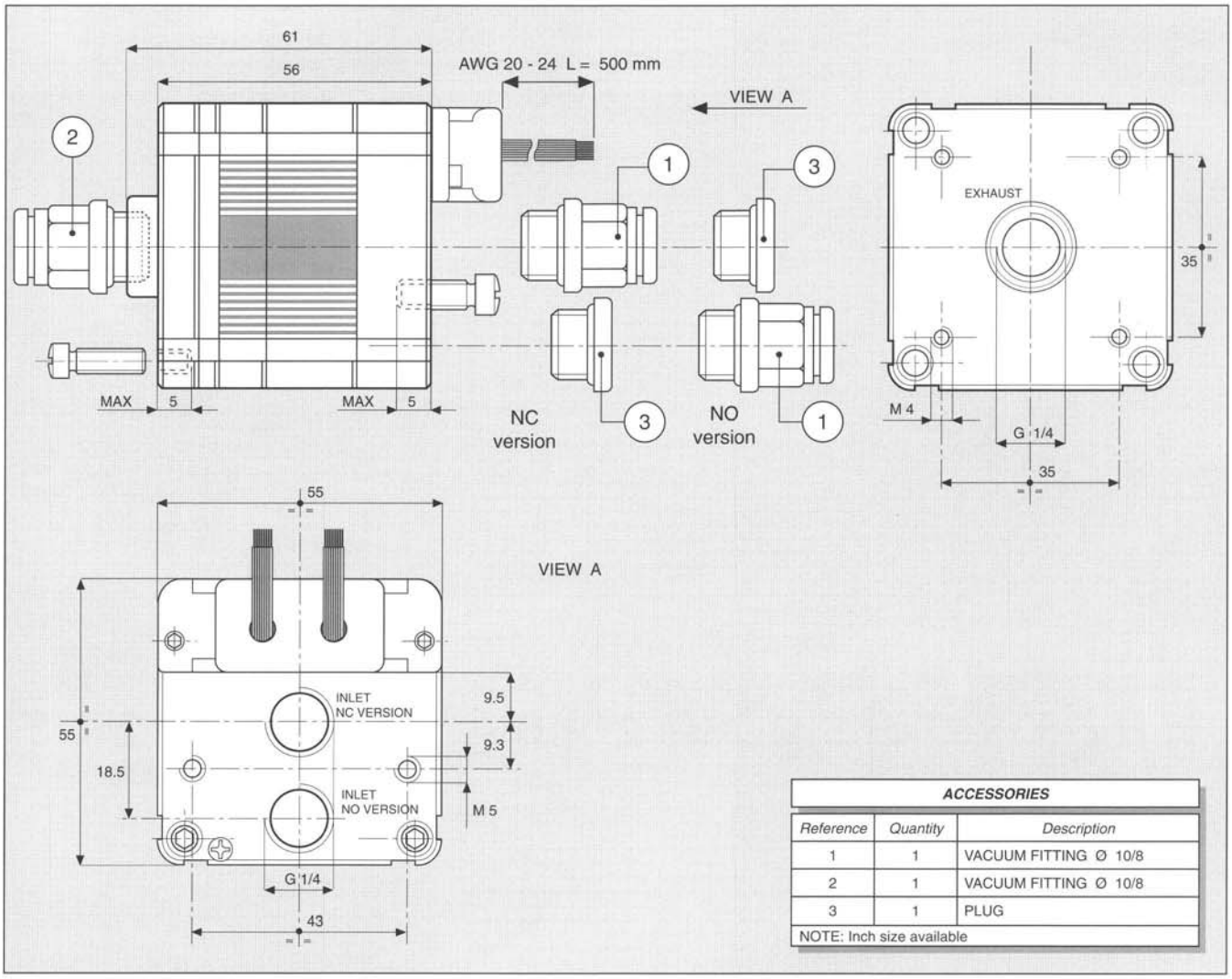
	RANGE	*MODELS*
V	10^{-5} Torr	All

PORT CONNECTION

0	Integrated cables IP 62 L = 500 mm
E	Presetting for Easy connection IP 52 - IP 65 (only 4 and 8 controls)

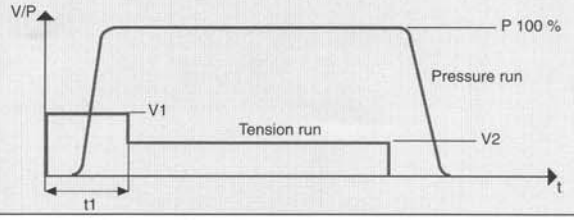
SPECIAL PROTECTIONS

Only with EASY IP 65 port connection	
M	Stainless steel (INOX) flanges
N	EPOX BLACK varnished flanges



ACCESSORIES		
Reference	*Quantity*	*Description*
1	1	VACUUM FITTING Ø 10/8
2	1	VACUUM FITTING Ø 10/8
3	1	PLUG
NOTE: Inch size available		

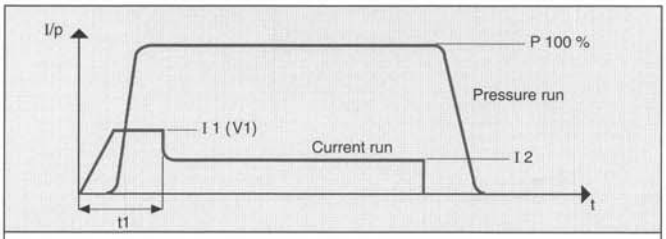
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC

CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

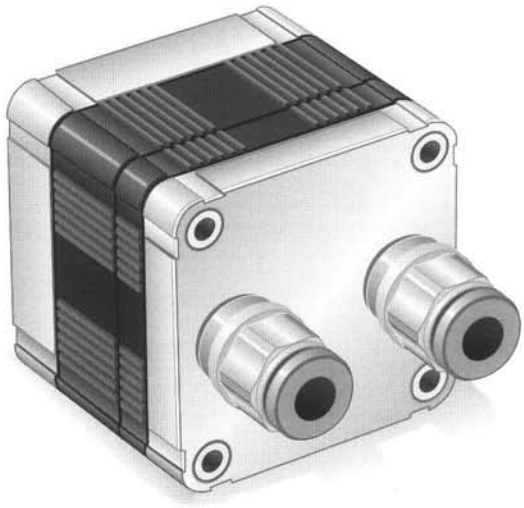
I 1 = 5.6 A	t 1 = 2 ms	I 2 = 2.4 A

ELECTRICAL PORT CONNECTION

COLOUR	1 CONTROL	2 CONTROLS	4 CONTROLS	8 CONTROLS
BLACK	COMMON	COMMON	COMMON	COMMON
BROWN	—	1	1	1
RED	1	2	2	2
ORANGE	—	—	3	3
YELLOW	—	—	4	4
GREEN	—	—	—	5
BLUE	—	—	—	6
VIOLET	—	—	—	7
GREY	—	—	—	8

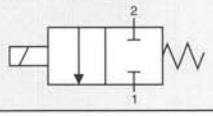
752 VACUUM • 2/2

NC NO

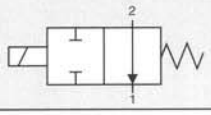


CONTROL: DIRECT | PFM | PNM | PWM

N. 2 NC



N. 2 NO



GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)		
FILTRATION RATING	Mix 40 micron		
TEMPERATURE	– 10 + 50°C (Standard version)		
RESPONSE TIME IN OPENING	12 / 24 < 7 ms	JJ < 5 ms	XX / KK < 2 ms
RESPONSE TIME IN CLOSING	12 / 24 < 3 ms	JJ < 2 ms	XX / KK < 2 ms
MAXIMUM FREQUENCY	100 Hz	200 Hz	300 Hz
WEIGHT	330 g		
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles		
IP RATING	IP 52 - IP 62 - IP 65		

IDENTIFICATION CODE

	H	X	7	5	2	2	0	V	C	2	24

OUTLETS

2	2 Outlets

FUNCTION

A	NO
C	NC

ORIFICES

H	Ø eq = 1.8 mm
B	Ø eq = 2.6 mm
M	Ø eq = 3.0 mm (control tension JJ XX KK)

TYPE

2	2/2

VERSION

	Standard
H	HNBR Shutters

CONTROL TENSION

12	12 VDC ± 10 %	ED 100 %	1.4÷5.8W
24	24 VDC ± 10 %	ED 100 %	1.2÷5.0W
JJ	24 VDC ± 10 %	ED 100 %(1)	1.9÷7.6W
XX	Speed-up in current	ED 100 %(1)	—
KK	Speed-up in tension	ED 100 %(1)	—

(1) Only with Electronic Driver Boards PRB or UDB

No. ELECTRICAL CONTROLS

2	2 Controls
4	4 Controls
8	8 Controls
C	4 Controls / Integrated diodes with common 0 V
D	8 Controls / Integrated diodes with common 0 V
F	4 Controls / Integrated diodes with common 12 / 24 V
G	8 Controls / Integrated diodes with common 12 / 24 V

OPERATING PRESSURE

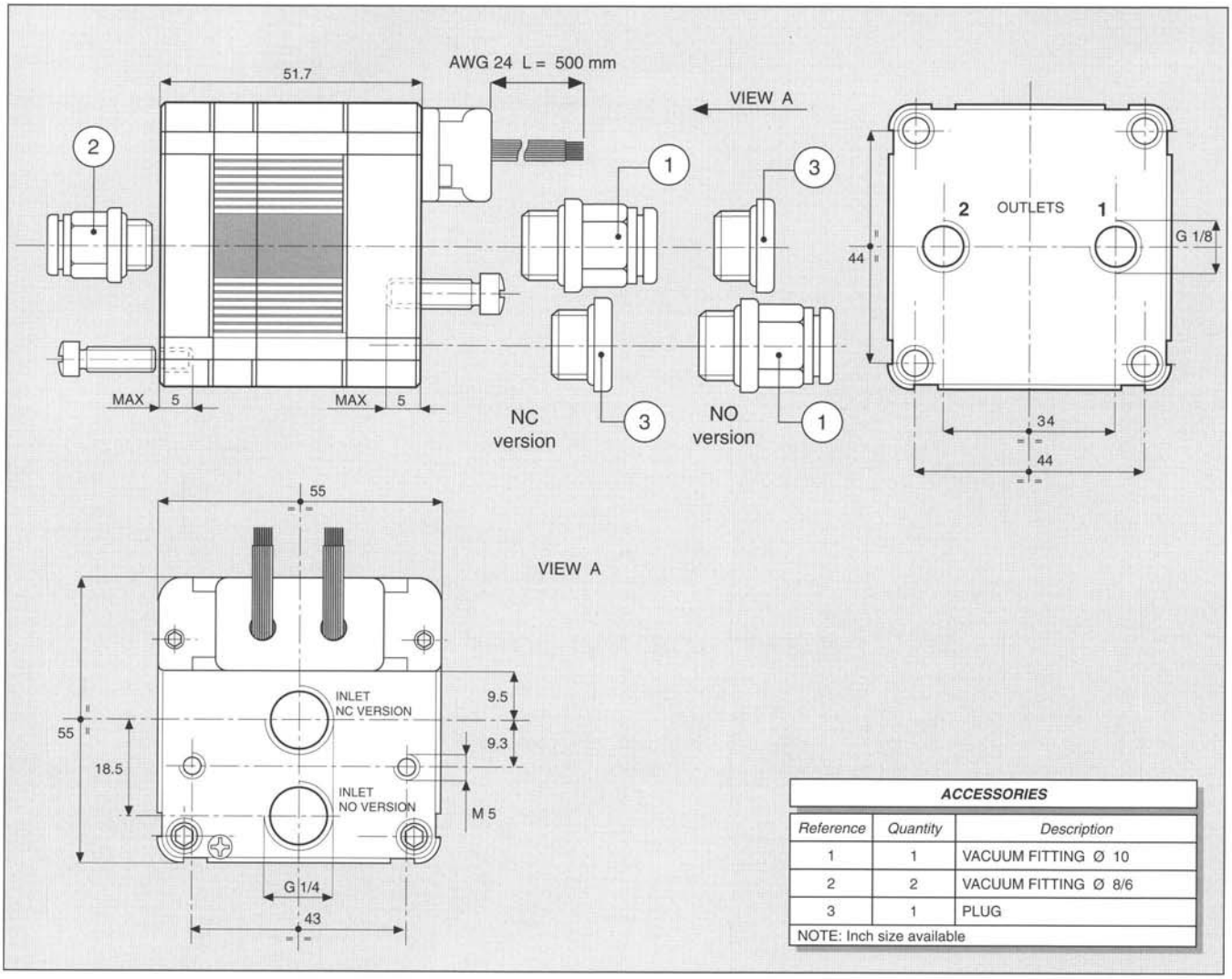
	RANGE	*MODELS*
V	10^{-5} Torr	All

PORT CONNECTION

0	Integrated cables IP 62 L = 500 mm
E	Presetting for Easy connection IP 52 - IP 65 (only 4 and 8 controls)

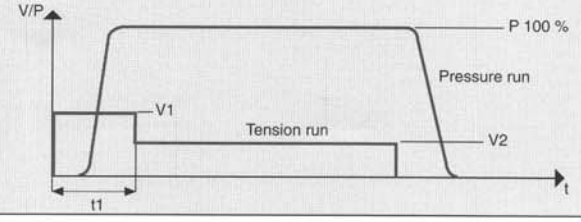
SPECIAL PROTECTIONS

	Only with EASY IP 65 port connection
M	Stainless steel (INOX) flanges
N	EPOX BLACK varnished flanges



ACCESSORIES		
Reference	*Quantity*	*Description*
1	1	VACUUM FITTING Ø 10
2	2	VACUUM FITTING Ø 8/6
3	1	PLUG
NOTE: Inch size available		

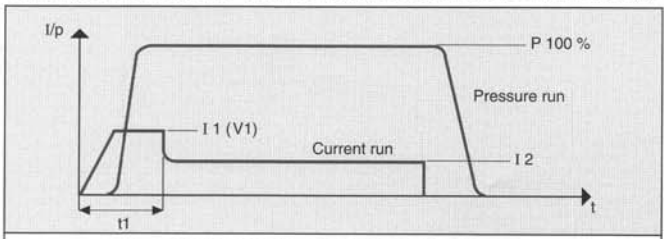
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC

CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

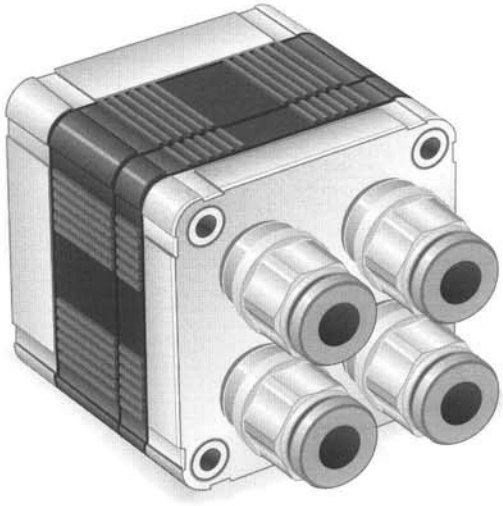
I 1 = 2.8 A	t 1 = 2 ms	I 2 = 1.2 A

ELECTRICAL PORT CONNECTION

COLOUR	2 CONTROLS (SINGLE CABLES)	2 CONTROLS EASY CONNECTION IP 52	4 CONTROLS (OUTLET)	8 CONTROLS (OUTLET)
BLACK	COMMON	COMMON	COMMON	COMMON
BROWN	1	1	1 (1)	1 (1)
RED	2	—	2 (1)	2 (1)
ORANGE	—	2	3 (2)	3 (1)
YELLOW	—	—	4 (2)	4 (1)
GREEN	—	—	—	5 (2)
BLUE	—	—	—	6 (2)
VIOLET	—	—	—	7 (2)
GREY	—	—	—	8 (2)

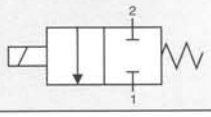
754 VACUUM • 2/2

NC NO

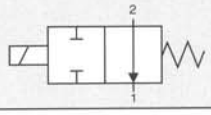


CONTROL: DIRECT | PFM | PNM | PWM

N. 4 NC



N. 4 NO



GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)		
FILTRATION RATING	Min 40 micron		
TEMPERATURE	– 10 + 50°C (Standard version)		
RESPONSE TIME IN OPENING	12 / 24 < 7 ms	JJ < 5 ms	XX / KK < 2 ms
RESPONSE TIME IN CLOSING	12 / 24 < 3 ms	JJ < 2 ms	XX / KK < 2 ms
MAXIMUM FREQUENCY	100 Hz	200 Hz	300 Hz
WEIGHT	340 g		
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles		
IP RATING	IP 52 - IP 62 - IP 65		

IDENTIFICATION CODE

	H	X	7	5	4	4	E	V	C	2	24

OUTLETS

4	4 Outlets

FUNCTION

A	NO
C	NC

ORIFICES

H	Ø eq = 1.3 mm
B	Ø eq = 1.8 mm
M	Ø eq = 2.1 mm (control tension JJ XX KK)

TYPE

2	2/2

VERSION

	Standard
H	HNBR Shutters

CONTROL TENSION

12	12 VDC ± 10 %	ED 100 %	1.4 ÷ 2.9W
24	24 VDC ± 10 %	ED 100 %	1.2 ÷ 2.5W
JJ	24 VDC ± 10 %	ED 100 %(1)	1.9 ÷ 3.8W
XX	Speed-up in current	ED 100 %(1)	—
KK	Speed-up in tension	ED 100 %(1)	—

(1) Only with Electronic Driver Boards PRB or UDB

No. ELECTRICAL CONTROLS

4	4 Control
8	8 Control
C	4 Controls / Integrated diodes with common 0 V
D	8 Controls / Integrated diodes with common 0 V
F	4 Controls / Integrated diodes with common 12 / 24 V
G	8 Controls / Integrated diodes with common 12 / 24 V

OPERATING PRESSURE

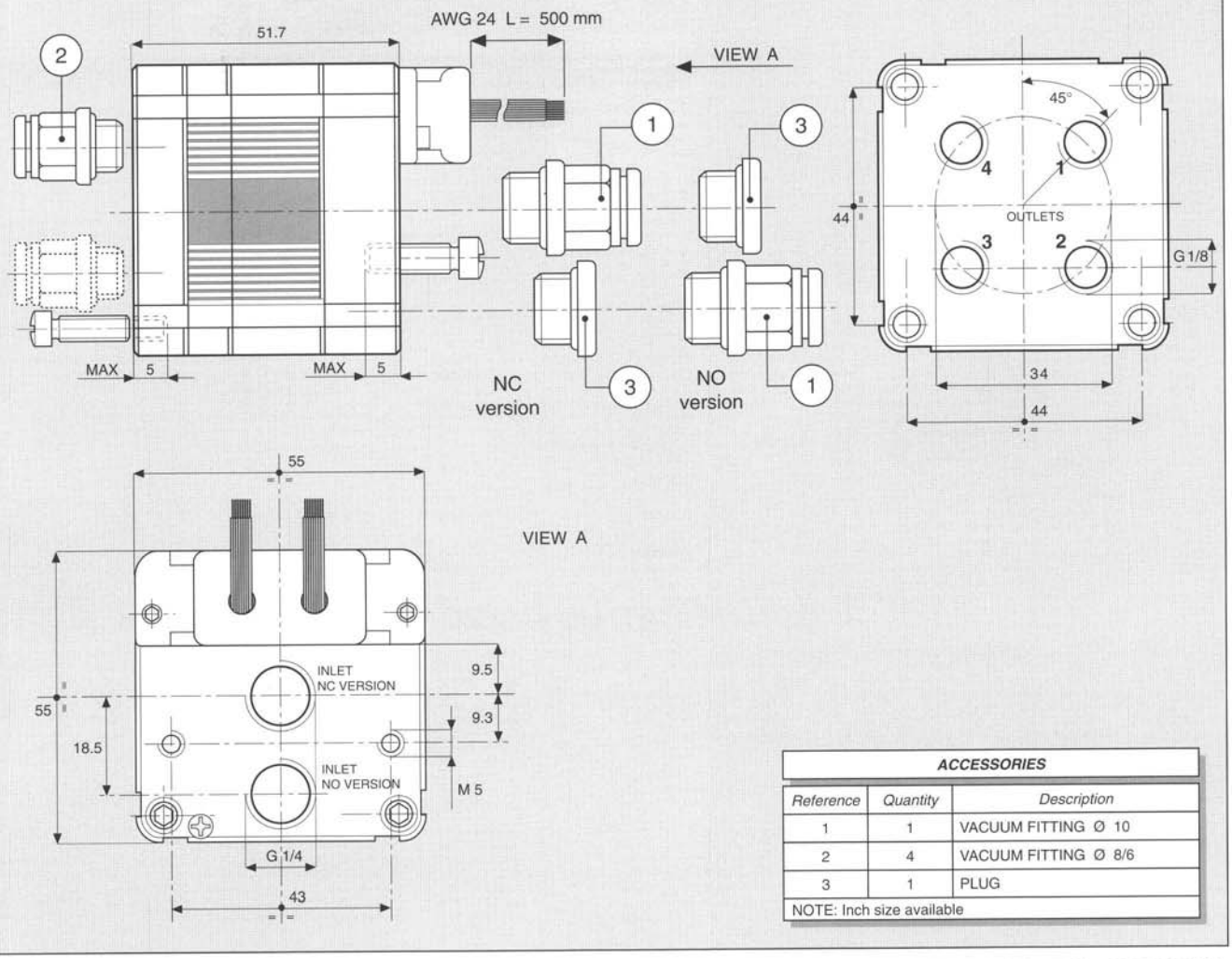
	RANGE	*MODELS*
V	10^{-5} Torr	All

PORT CONNECTION

0	Integrated cables IP 62 L = 500 mm
E	Presetting for Easy connection IP 52 - IP 65

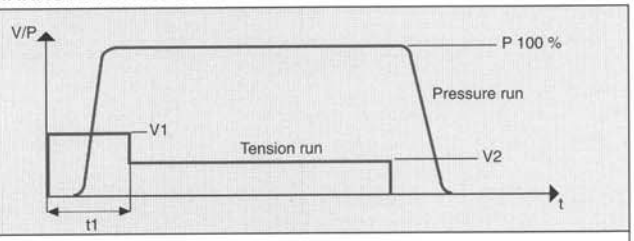
SPECIAL PROTECTIONS

Only with EASY IP 65 port connection	
M	Stainless steel (INOX) flanges
N	EPOX BLACK varnished flanges



ACCESSORIES		
Reference	*Quantity*	*Description*
1	1	VACUUM FITTING Ø 10
2	4	VACUUM FITTING Ø 8/6
3	1	PLUG
NOTE: Inch size available		

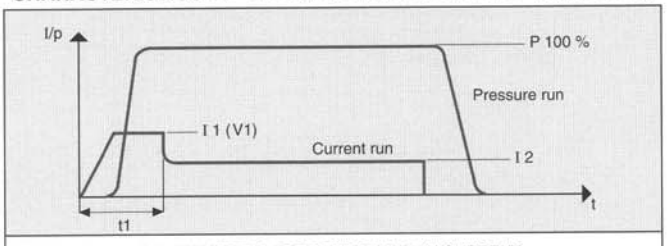
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC

CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

I 1 = 1.4 A	t 1 = 2 ms	I 2 = 0.6 A

ELECTRICAL PORT CONNECTION

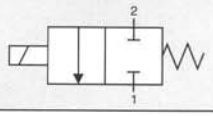
COLOUR	4 CONTROLS	8 CONTROLS (OUTLET)
BLACK	COMMON	COMMON
BROWN	1	1 (1)
RED	2	2 (1)
ORANGE	3	3 (2)
YELLOW	4	4 (2)
GREEN	—	5 (3)
BLUE	—	6 (3)
VIOLET	—	7 (4)
GREY	—	8 (4)

758 VACUUM • 2/2

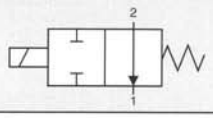
NC NO

CONTROL: DIRECT | PFM | PNM | PWM

N. 8 NC



N. 8 NO



GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)		
FILTRATION RATING	Min 40 micron		
TEMPERATURE	– 10 + 50°C (Standard version)		
RESPONSE TIME IN OPENING	12 / 24 < 7 ms	JJ < 5 ms	XX / KK < 2 ms
RESPONSE TIME IN OPENING	12 / 24 < 3 ms	JJ < 2 ms	XX / KK < 2 ms
MAXIMUM FREQUENCY	100 Hz	200 Hz	300 Hz
WEIGHT	350 g		
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles		
IP RATING	IP 52 - IP 62 - IP 65		

IDENTIFICATION CODE

	H	X	7	5	8	8	E	V	C	2	24

OUTLETS

8	8 Outlets

FUNCTION

A	NO
C	NC

ORIFICES

H	Ø eq = 0.9 mm
B	Ø eq = 1.3 mm
M	Ø eq = 1.5 mm (control tension JJ XX KK)

TYPE

2	2/2

VERSION

	Standard
H	HNBR Shutters

CONTROL TENSION

12	12 VDC ± 10 %	ED 100 %	1.4 W
24	24 VDC ± 10 %	ED 100 %	1.2 W
JJ	24 VDC ± 10 %	ED 100 % (1)	1.9 W
XX	Speed-up in current	ED 100 % (1)	—
KK	Speed-up in tension	ED 100 % (1)	—

(1) Only with Electronic Driver Boards PRB or UDB

No. ELECTRICAL CONTROLS

8	8 Control
D	8 Controls / Integrated diodes with common 0 V
G	8 Controls / Integrated diodes with common 12 / 24 V

OPERATING PRESSURE

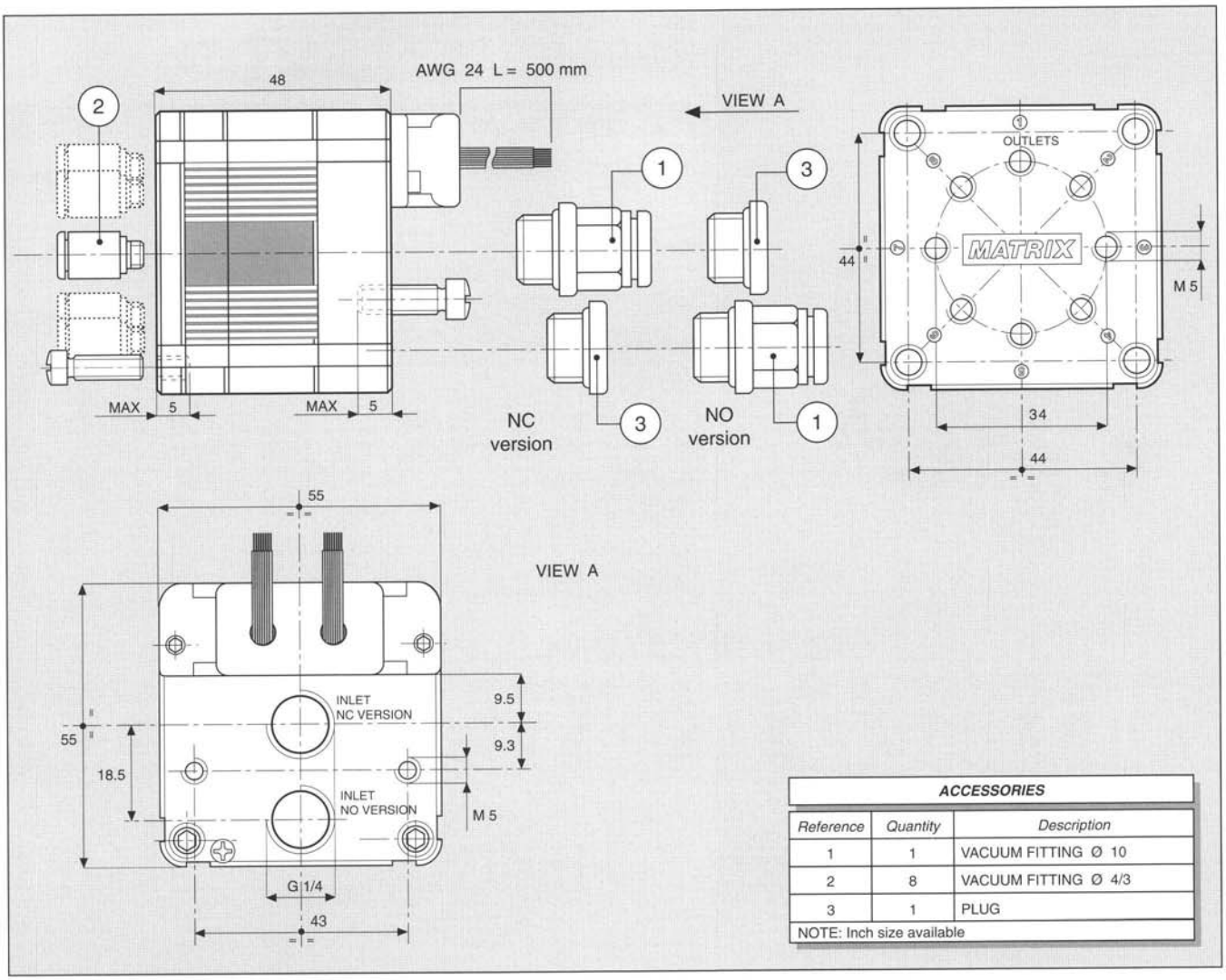
	RANGE	*MODELS*
V	10^{-5} Torr	All

PORT CONNECTION

0	Integrated cables IP 62 L = 500 mm
E	Presetting for Easy connection IP 52 - IP 65

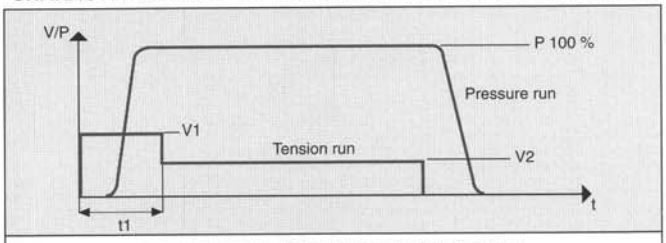
SPECIAL PROTECTIONS

	Only with EASY IP 65 port connection
M	Stainless steel (INOX) flanges
N	EPOX BLACK varnished flanges



ACCESSORIES		
Reference	*Quantity*	*Description*
1	1	VACUUM FITTING Ø 10
2	8	VACUUM FITTING Ø 4/3
3	1	PLUG
NOTE: Inch size available		

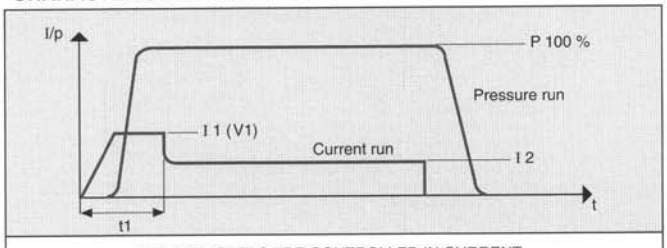
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC

CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

I 1 = 0.7 A	t 1 = 2 ms	I 2 = 0.3 A

ELECTRICAL PORT CONNECTION

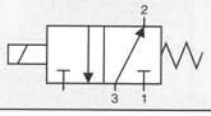
COLOUR	8 CONTROLS
BLACK	COMMON
BROWN	1
RED	2
ORANGE	3
YELLOW	4
GREEN	5
BLUE	6
VIOLET	7
GREY	8

751 VACUUM • 3/2

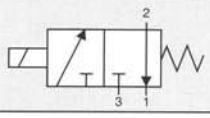
NC NO

CONTROL: DIRECT

N. 1 NC



N. 1 NO



GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)		
FILTRATION RATING	Min 40 micron		
TEMPERATURE	– 10 + 50°C (Standard version)		
RESPONSE TIME IN OPENING	12 / 24 < 7 ms	JJ < 5 ms	XX / KK < 2 ms
RESPONSE TIME IN CLOSING	12 / 24 < 3 ms	JJ < 2 ms	XX / KK < 2 ms
MAXIMUM FREQUENCY	100 Hz	200 Hz	300 Hz
WEIGHT	380 g		
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles		
IP RATING	IIP 62		

IDENTIFICATION CODE

	H	X	7	5	1	1	0	V	C	3	24

OUTLETS

1	1 Outlet

FUNCTION

A	NO
C	NC

ORIFICES

H	Ø eq = 2.5 mm
B	Ø eq = 3.6 mm
M	Ø eq = 4.2 mm (control tension JJ XX KK)

TYPE

3	3/2

VERSION

	Standard
H	HNBR Shutters

CONTROL TENSION

12	12 VDC ± 10 %	ED 100 %	11.6 W
24	24 VDC ± 10 %	ED 100 %	10.0 W
JJ	24 VDC ± 10 %	ED 100 % (1)	15.2 W
XX	Speed-up in current	ED 100 % (1)	—
KK	Speed-up in tension	ED 100 % (1)	—

(1) Only with Electronic Driver Boards PRB or UDB

No. ELECTRICAL CONTROLS

1	1 Control

OPERATING PRESSURE

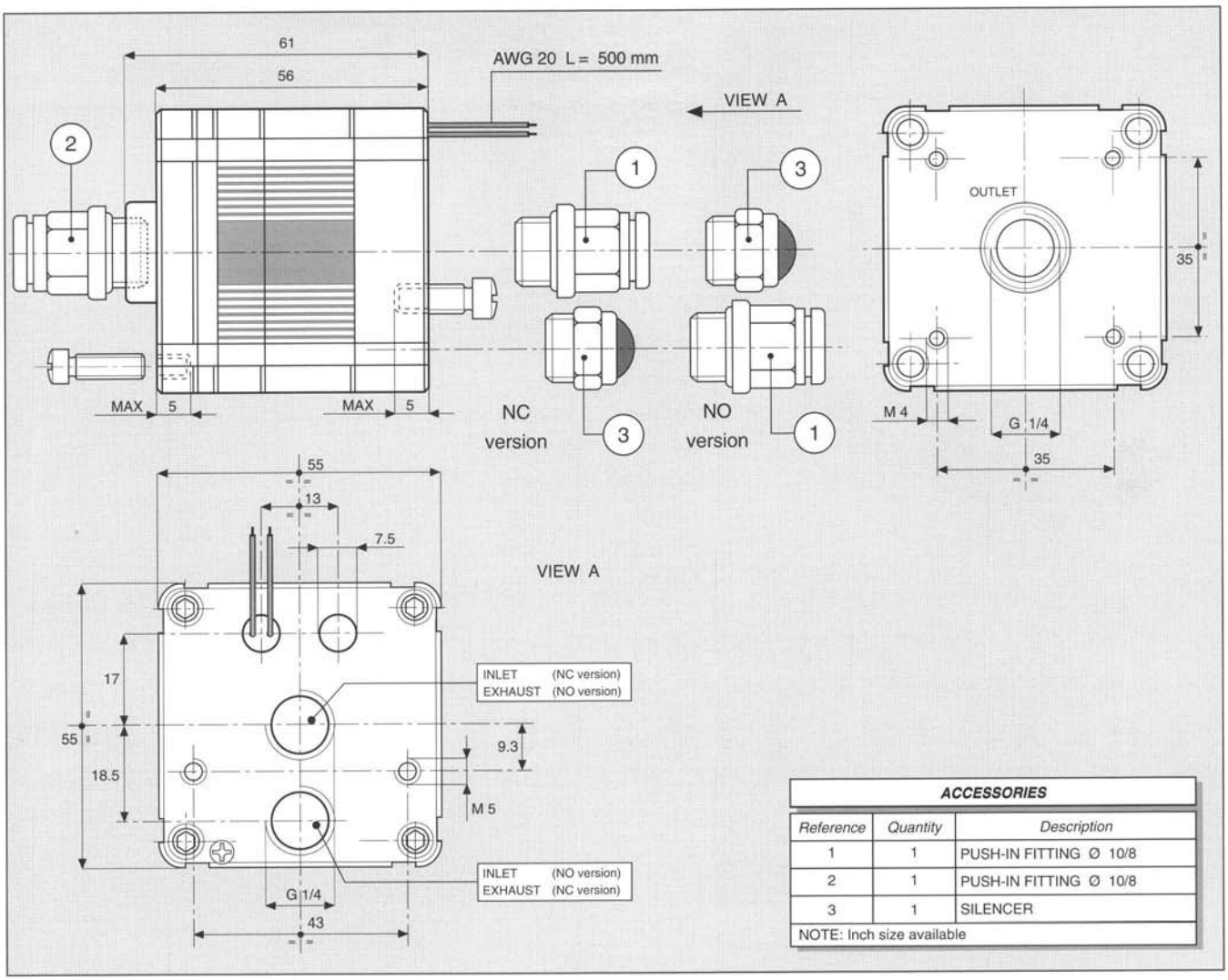
	RANGE	*MODELS*
V	10^{-5} Torr	All

PORT CONNECTION

0	Integrated cables IP 62 L = 500 mm

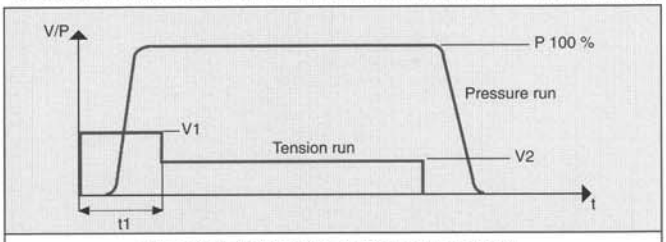
SPECIAL PROTECTIONS

M	Stainless steel (INOX) flanges
N	EPOX BLACK varnished flanges



ACCESSORIES		
Reference	*Quantity*	*Description*
1	1	PUSH-IN FITTING Ø 10/8
2	1	PUSH-IN FITTING Ø 10/8
3	1	SILENCER
NOTE: Inch size available		

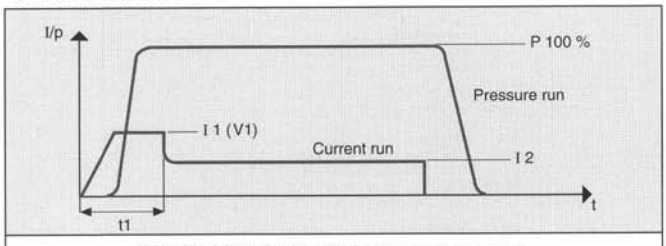
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC

CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

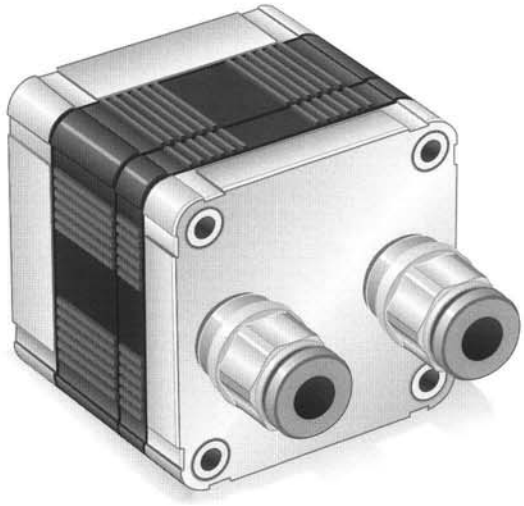
I 1 = 5.6 A	t 1 = 2 ms	I 2 = 2.4 A

ELECTRICAL PORT CONNECTION

COLOUR	1 CONTROL
BLACK	COMMON
RED	1

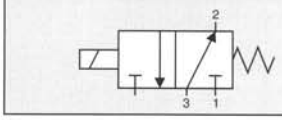
752 VACUUM • 3/2

NC NO

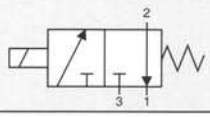


CONTROL: DIRECT

N. 2 NC



N. 2 NO



GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)		
FILTRATION RATING	Min 40 micron		
TEMPERATURE	– 10 + 50°C (Standard version)		
RESPONSE TIME IN OPENING	12 / 24 < 7 ms	JJ < 5 ms	XX / KK < 2 ms
RESPONSE TIME IN CLOSING	12 / 24 < 3 ms	JJ < 2 ms	XX / KK < 2 ms
MAXIMUM FREQUENCY	100 Hz	200 Hz	300 Hz
WEIGHT	330 g		
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles		
IP RATING	IP 52 - IP 62		

IDENTIFICATION CODE

	H	X	7	5	2	2	0	V	C	3	24

OUTLETS

2	2 Outlets

FUNCTION

A	NO
C	NC

ORIFICES

H	Ø eq = 1.8 mm
B	Ø eq = 2.6 mm
M	Ø eq = 3.0 mm (control tension JJ XX KK)

TYPE

3	3/2

VERSION

	Standard
H	HNBR Shutters

CONTROL TENSION

12	12 VDC ± 10 %	ED 100 %	5.8 W
24	24 VDC ± 10 %	ED 100 %	5.0 W
JJ	24 VDC ± 10 %	ED 100 % (1)	7.6 W
XX	Speed-up in current	ED 100 % (1)	—
KK	Speed-up in tension	ED 100 % (1)	—

(1) Only with Electronic Driver Boards PRB or UDB

No. ELECTRICAL CONTROLS

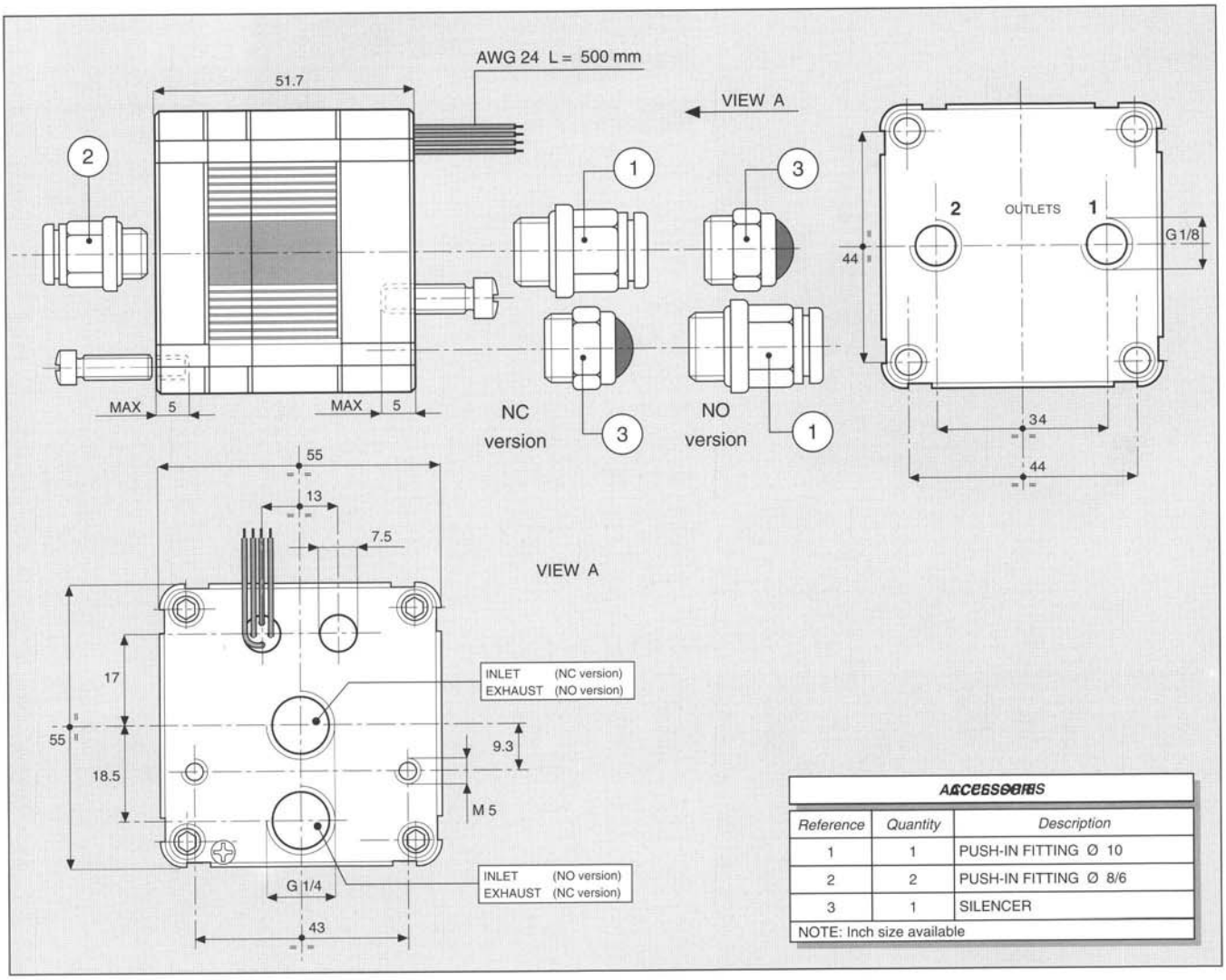
2	2 Control

OPERATING PRESSURE

	RANGE	*MODELS*
V	10^{-5} Torr	All

PORT CONNECTION

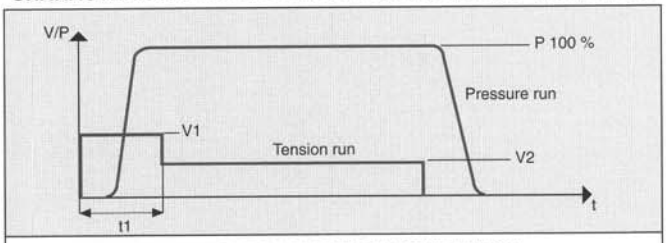
0	Integrated cables IP 62 L = 500 mm
E	Presetting for Easy connection IP 52



ACCESSORIES

Reference	Quantity	Description
1	1	PUSH-IN FITTING Ø 10
2	2	PUSH-IN FITTING Ø 8/6
3	1	SILENCER
NOTE: Inch size available		

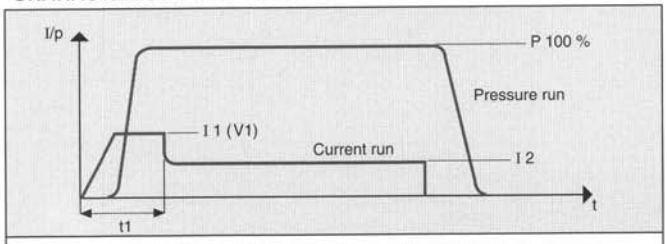
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC

CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

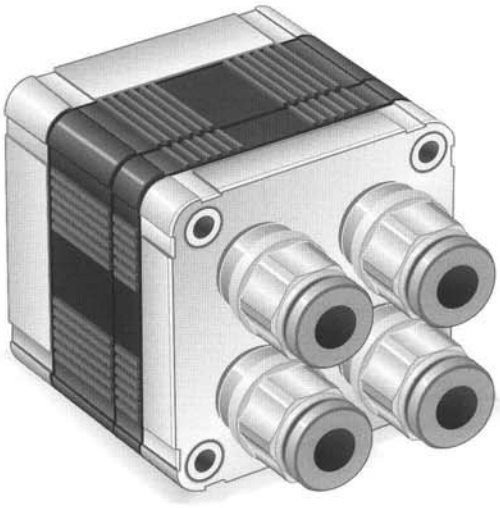
I 1 = 2.8 A	t 1 = 2 ms	I 2 = 1.2 A

ELECTRICAL PORT CONNECTION

COLOUR	2 CONTROL (SINGLE CABLES)	2 CONTROL EASY CONNECTION IP 52
BLACK	COMMON	COMMON
BROWN	1	1
RED	2	—
ORANGE	—	2

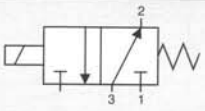
754 VACUUM • 3/2

NC NO

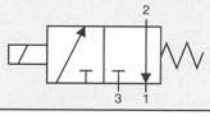


CONTROL: DIRECT

N. 4 NC



N. 4 NO



GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)		
FILTRATION RATING	Min 40 micron		
TEMPERATURE	– 10 + 50°C (Standard version)		
RESPONSE TIME IN OPENING	12 / 24 < 7 ms	JJ < 5 ms	XX / KK < 2 ms
RESPONSE TIME IN CLOSING	12 / 24 < 3 ms	JJ < 2 ms	XX / KK < 2 ms
MAXIMUM FREQUENCY	100 Hz	200 Hz	300 Hz
WEIGHT	340 g		
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles		
IP RATING	IP 52 - IP 62 - IP 65		

IDENTIFICATION CODE

	H	X	7	5	4	4	E	V	C	3	24

OUTLETS

4	4 Outlets

FUNCTION

A	NO
C	NC

ORIFICES

H	Ø eq = 1.3 mm
B	Ø eq = 1.8 mm
M	Ø eq = 2.1 mm (control tension JJ XX KK)

TYPE

3	3/2

VERSION

	Standard
H	HNBR Shutters

CONTROL TENSION

12	12 VDC ± 10 %	ED 100 %	2.9 W
24	24 VDC ± 10 %	ED 100 %	2.5 W
JJ	24 VDC ± 10 %	ED 100 % (1)	3.8 W
XX	Speed-up in current	ED 100 % (1)	—
KK	Speed-up in tension	ED 100 % (1)	—

(1) Only with Electronic Driver Boards PRB or UDB

No. ELECTRICAL CONTROLS

4	4 Controls
C	4 Controls / Integrated diodes with common 0 V
F	4 Controls / Integrated diodes with common 12 / 24 V

OPERATING PRESSURE

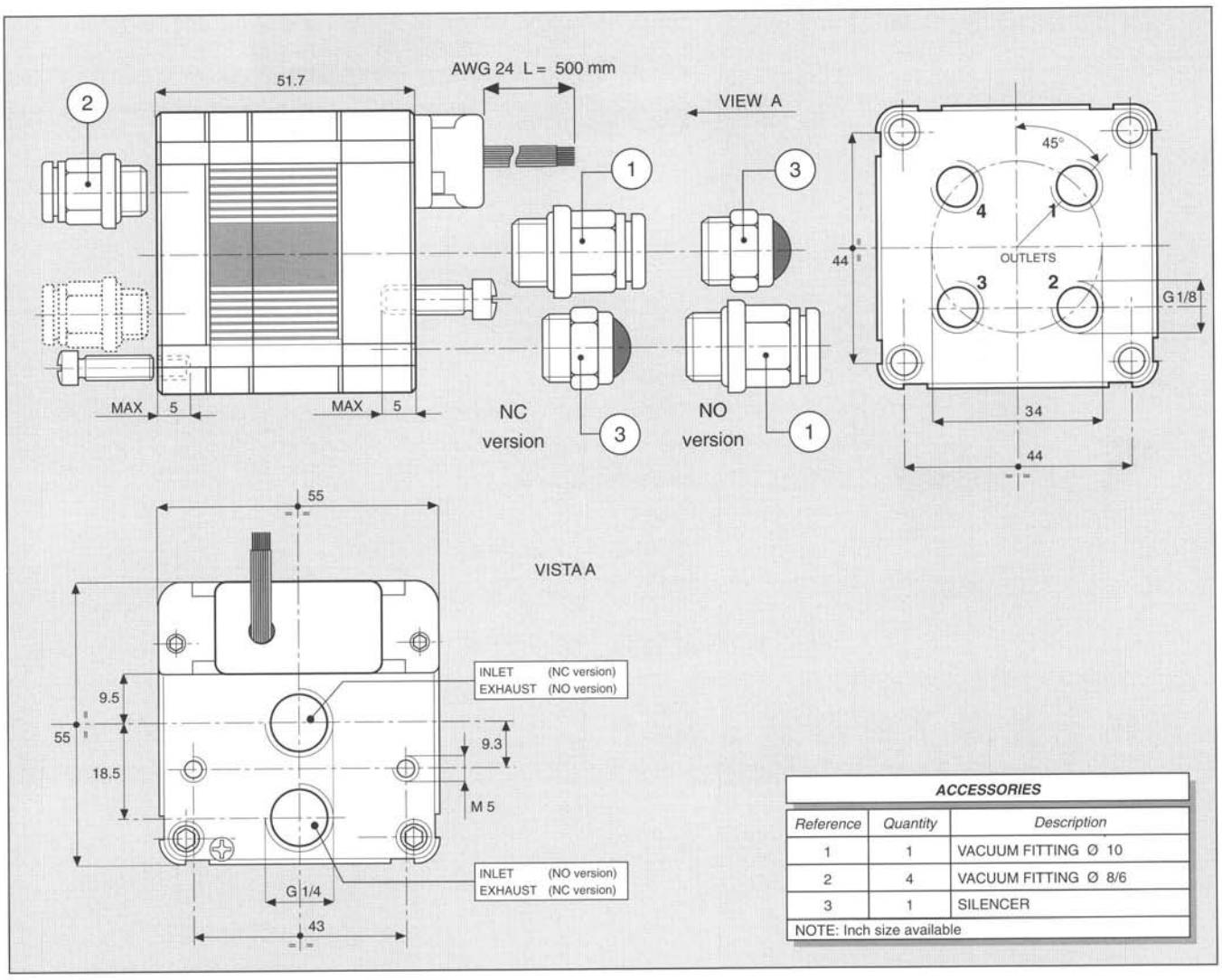
	RANGE	*MODELS*
V	10^{-5} Torr	All

PORT CONNECTION

0	Integrated cables IP 62 L = 500 mm
E	Presetting for Easy connection IP 52 - IP 65

SPECIAL PROTECTIONS

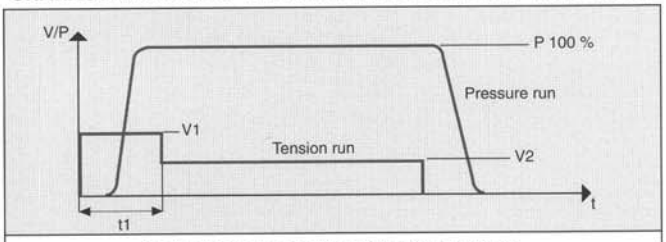
	Only with EASY IP 65 port connection
M	Stainless steel (INOX) flanges
N	EPOX BLACK varnished flanges



ACCESSORIES

Reference	*Quantity*	*Description*
1	1	VACUUM FITTING Ø 10
2	4	VACUUM FITTING Ø 8/6
3	1	SILENCER
NOTE: Inch size available		

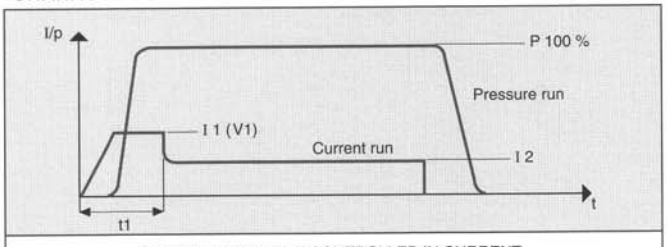
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC

CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

I 1 = 1.4 A	t 1 = 2 ms	I 2 = 0.6 A

ELECTRICAL PORT CONNECTION

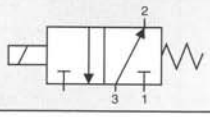
COLOUR	4 CONTROL
BLACK	COMMON
BROWN	1
RED	2
ORANGE	3
YELLOW	4

758 VACUUM • 3/2

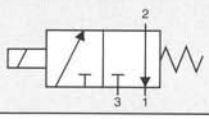
NC NO

CONTROL: DIRECT

N. 8 NC



N. 8 NO



GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)		
FILTRATION RATING	Min 40 micron		
TEMPERATURE	– 10 + 50°C (Standard version)		
RESPONSE TIME IN OPENING	12 / 24 < 7 ms	JJ < 5 ms	XX / KK < 2 ms
RESPONSE TIME IN CLOSING	12 / 24 < 3 ms	JJ < 2 ms	XX / KK < 2 ms
MAXIMUM FREQUENCY	100 Hz	200 Hz	300 Hz
WEIGHT	350 g		
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles		
IP RATING	IP 52 - IP 62 - IP 65		

IDENTIFICATION CODE

	H	X	7	5	8	8	E	V	C	3	24

OUTLETS

8	8 Outlets

FUNCTION

A	NO
C	NC

ORIFICES

H	Ø eq = 0.9 mm
B	Ø eq = 1.3 mm
M	Ø eq = 1.5 mm (control tension JJ XX KK)

TYPE

3	3/2

VERSION

	Standard
H	HNBR Shutters

CONTROL TENSION

12	12 VDC ± 10 %	ED 100 %	1.4 W
24	24 VDC ± 10 %	ED 100 %	1.2 W
JJ	24 VDC ± 10 %	ED 100 %(1)	1.9 W
XX	Speed-up in current	ED 100 %(1)	—
KK	Speed-up in tension	ED 100 %(1)	—

(1) Only with Electronic Driver Boards PRB or UDB

No. ELECTRICAL CONTROLS

8	8 Controls
D	8 Controls / Integrated diodes with common 0 V
G	8 Controls / Integrated diodes with common 12 / 24 V

OPERATING PRESSURE

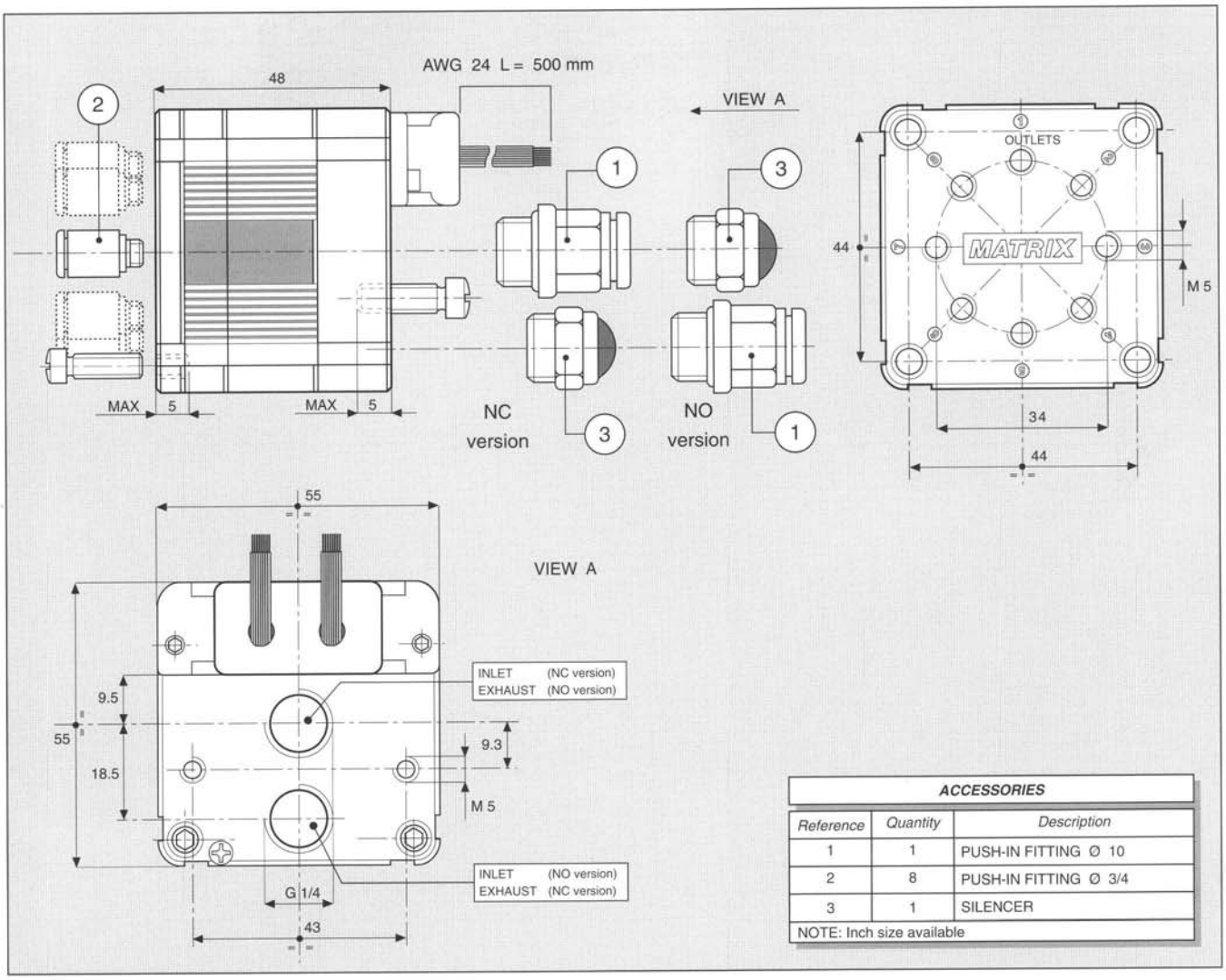
	RANGE	*MODELS*
V	10^{-5} Torr	All

PORT CONNECTION

0	Integrated cables IP 62 L = 500 mm
E	Presetting for Easy connection IP 52 - IP 65

SPECIAL PROTECTIONS

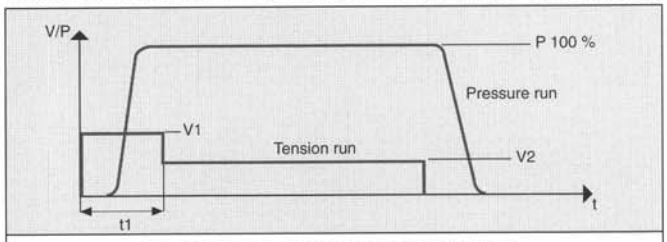
	Only with EASY IP 65 port connection
M	Stainless steel (INOX) flanges
N	EPOX BLACK varnished flanges



ACCESSORIES

Reference	*Quantity*	*Description*
1	1	PUSH-IN FITTING Ø 10
2	8	PUSH-IN FITTING Ø 3/4
3	1	SILENCER
NOTE: Inch size available		

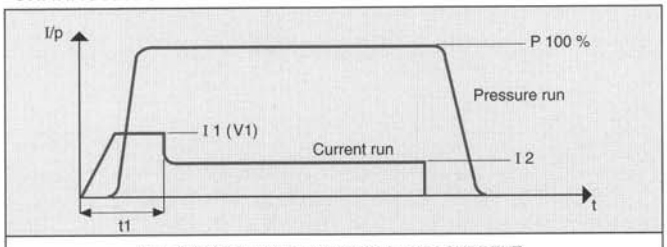
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC

CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

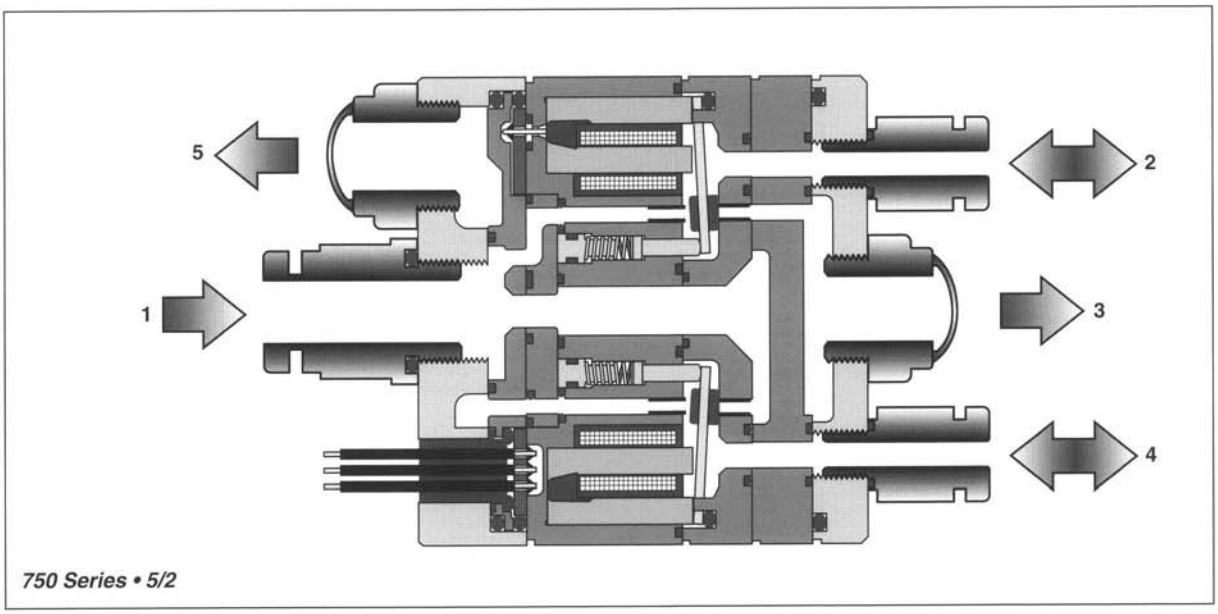
I 1 = 0.7 A	t 1 = 2 ms	I 2 = 0.3 A

ELECTRICAL PORT CONNECTION

COLOUR	8 CONTROLS
BLACK	COMMON
BROWN	1
RED	2
ORANGE	3
YELLOW	4
GREEN	5
BLUE	6
VIOLET	7
GREY	8

SOLENOID VALVES 750 SERIES • 5/2

5/2 750 Series encloses 8 shutters in a single body, four in NC configuration and four in NO configuration. Shutters are placed in NC - NO couples and every couple is combined to a single control, providing the change of function.
The 8 outlets of the solenoid valve are also placed in an alternated NC - NO sequence and every couple is prearranged to control a double-acting cylinder.
The models present all the innovations offered by Matrix technology, combining dynamic high-performance with the simplicity and reliability of the manufacture. Response times are of milliseconds while operating life lasts over 500 million cycles.
Due to the control of speed-up type, dynamic characteristics are even more improved. Standard solenoid valves have a response time lower than 5 ms in opening and in closing, with a maximum operating frequency of 100 Hz.
For 5/2 750 series, a lot of accessories are available, such as IP 52 or IP 56 connectors, manifolds with different positions and speed-up driver boards.



750 Series • 5/2

Advantages

- Compact dimension.
- Short response times.
- Insensitivity to frequency work and to vibrations.
- Low absorbed power.
- Precision, repetitiveness and flexibility.
- Long operating life.

Applications

- Process and precision instrumentation.
- Industrial automation.
- Robotics.
- Positioning systems.
- Piloting.

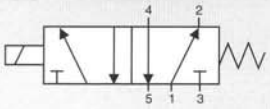
Materials

- Body in PPS.
- Flanges in Al.
- Seals in NBR (shutters in HNBR if required).

758 • 5/2 NC-NO

CONTROL:	DIRECT			

N. 4



GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)
FILTRATION RATING	Min 40 micron
TEMPERATURE	– 10 + 50°C (Standard version)
RESPONSE TIME IN OPENING	KK < 5 ms
RESPONSE TIME IN CLOSING	KK < 5 ms
MAXIMUM FREQUENCY	100 Hz
WEIGHT	380 g
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles
IP RATING	IP 52 - IP 65

IDENTIFICATION CODE

	H	X	7	5	8	4	E	8	E	5	K K

OUTLETS

8	8 Outlets

FUNCTIONS

E	N.4 Outlets NO N.4 Outlets NC

FLOW RATE (at 6 bar)

H	50 Nl / min

TYPE

5	5/2

VERSION

	Standard
H	HNBR Shutters

CONTROL TENSION

KK	Speed-up in tension	ED 100 % (1)	—

(1) Only with Electronic Driver Boards PRB or UDB

No. ELECTRICAL CONTROLS

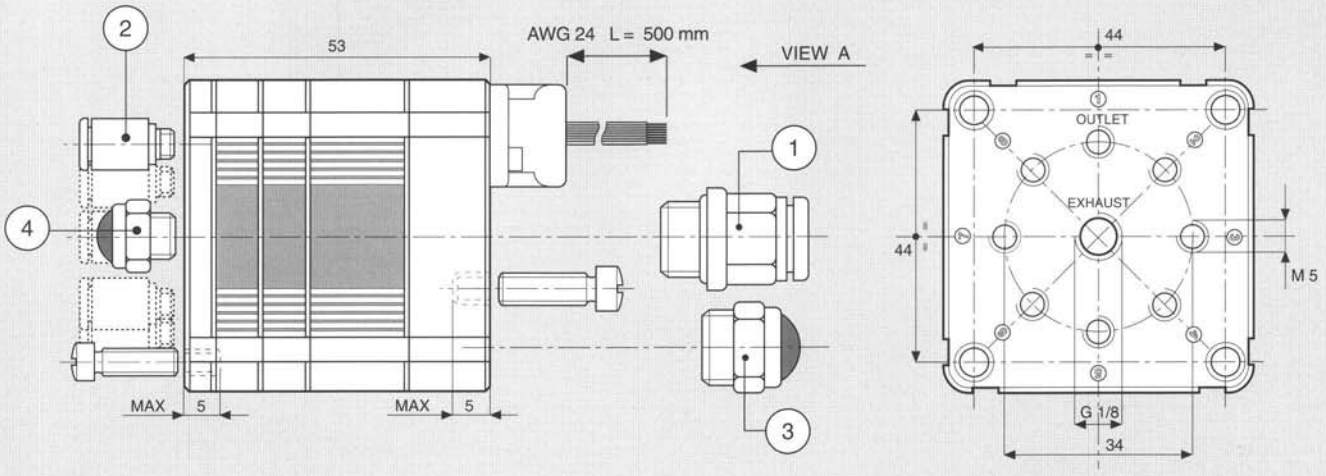
4	4 Controls

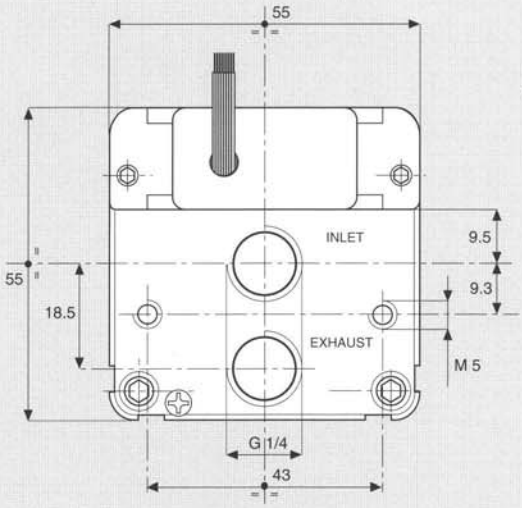
PORT CONNECTION

E	Presetting for Easy connection IP 52 - IP 65

OPERATING PRESSURE

	RANGE	*MODELS*
8	2 - 6 bar	All

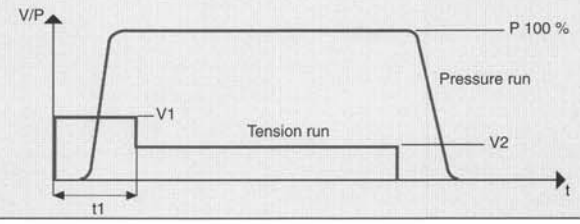




OUTLETS M 5	
Normally Open	1 - 3 - 5 - 7
Normally Closed	2 - 4 - 6 - 8

ACCESSORIES		
Reference	*Quantity*	*Description*
1	1	PUSH-IN FITTING Ø 10
2	8	PUSH-IN FITTING Ø 4/6
3	1	SILENCER
4	1	SILENCER
NOTE: Inch size available		

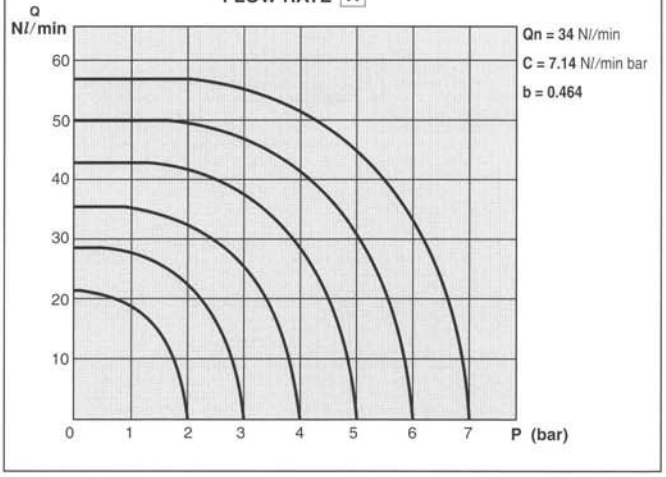
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 6 ms	V 2 = 5 VDC

FLOW RATE H



ELECTRICAL PORT CONNECTION

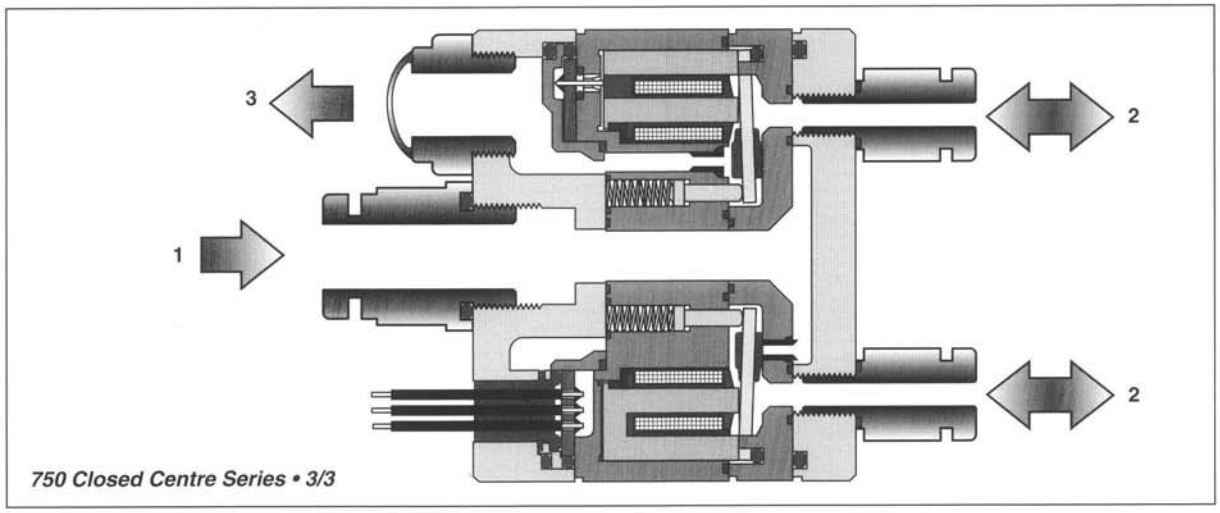
COLOUR	4 CONTROLS
BLACK	COMMON
BROWN	1 – 2
RED	3 – 4
ORANGE	5 – 6
YELLOW	7 – 8

SOLENOID VALVES 750 SERIES • 3/3

750 Series 3/3 presents a small-sized single body with four utilities, assuming, according to the different models, the following configurations:

- **NC outlet - NO air drain port (function code :'C' - Exhaust center)**
  This configuration allows feeding separately four pneumatic rooms and their corresponding automatic air drain port in absence of electric control.
- **NC outlet - NC air drain port (function code: 'D' - Closed center)**
  This configuration allows separately feeding four pneumatic rooms and maintaining the pressure level in absence of electric control.
- **Outlet NO - NC air drain port (function code 'A' - Pressure center)**
  This configuration allows separately feeding four pneumatic rooms and assures the continuous supply (feeding) in electric control absence.

In the present model, all the innovations offered by Matrix technology, this combines special dynamic performance to the simplicity and reliability of manufacture, are present. Response times are of millisecond range, while operation life is over 500 million cycles.
With a speed-up kind control, dynamic characteristics are even more improved. Standard 24 VDC control solenoid valves have a response time lower than 5 ms in opening and than 2 ms in closing, with a maximum operation frequency 200 Hz. Speed-up control solenoid valves have a response time lower than 2 ms both in opening and in closing, with a maximum operation frequency of 300 Hz.
Besides high-speed characteristics, 750 Series solenoid valves offer flow rate values up to 100 ℓ/minute (ANR) for every single outlet, with feeding pressure from 0 to 4 bar.
For 750 closed centres series, a lot of accessories is available, such as IP 52 or IP 56 connectors, manifolds with different positions and speed-up driver boards.



750 Closed Centre Series • 3/3

Advantages

- Compact dimension.
- Short response times.
- Insensitivity both to frequency work and to vibrations.
- Low absorbed power.
- Precision, repetitiveness and flexibility.
- Long operating life.

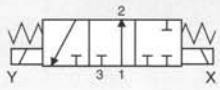
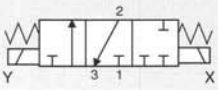
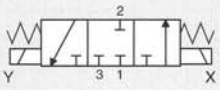
Applications

- Process and precision instrumentation.
- Biomedical equipment.
- Pressure-therapy systems.
- Positioning systems.

Materials

- Body in PPS.
- Flanges in Al.
- Seals in NBR (shutters in HNBR if required).

CONTROL: DIRECT | PFM | PNM | PWM

FUNCTION A	FUNCTION C	FUNCTION D
		

GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)		
FILTRATION RATING	Min 40 micron		
TEMPERATURE	– 10 + 50°C (Standard version)		
RESPONSE TIME IN OPENING	12 / 24 < 7 ms	JJ < 5 ms	XX / KK < 2 ms
RESPONSE TIME IN CLOSING	12 / 24 < 3 ms	JJ < 2 ms	XX / KK < 2 ms
MAXIMUM FREQUENCY	100 Hz	200 Hz	300 Hz
WEIGHT	340 g		
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles		
IP RATING	IP 52 - IP 62 - IP 65		

IDENTIFICATION CODE

	M	K	7	5	2	4	E	1	A	2	24

NUMBER OF POSITIONS

K	3 Positions

OUTLETS

2	2 Outlets

FUNCTIONS

A	Outlet NO - Exhaust NC
C	Outlet NC - Exhaust NO
D	Outlet NC - Exhaust NC

FLOW RATE (at 6 bar)

H	100 Nl/min
B	160 Nl/min
M	200 Nl/min (control tensiono JJ XX KK)

TYPE

2	2 Pairs 2/2

VERSION

	Standard
H	HNBR Shutters

CONTROL TENSION

12	12 VDC ± 10 %	ED 100 %	2.9 W
24	24 VDC ± 10 %	ED 100 %	2.5 W
JJ	24 VDC ± 10 %	ED 100 % (1)	3.8 W
XX	Speed-up in current	ED 100 % (1)	—
KK	Speed-up in tension	ED 100 % (1)	—

(1) Only with Electronic Driver Boards PRB or UDB

No. ELECTRICAL CONTROLS

4	4 Control
C	4 Controls / Integrated diodes with common 0 V
F	4 Controls / Integrated diodes with common 12 / 24 V

PORT CONNECTION

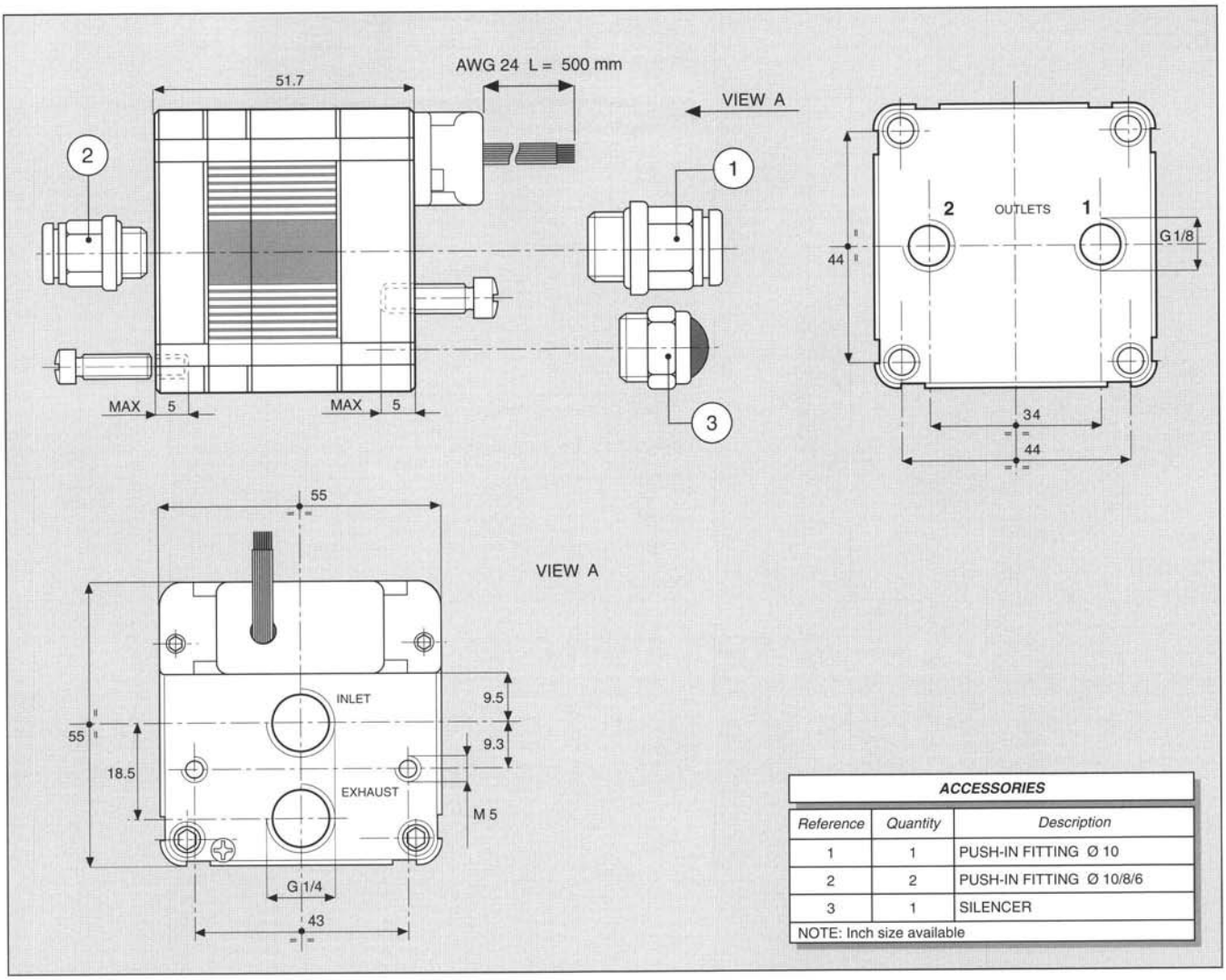
0	Integrated cables IP 62 L = 500 mm
E	Presetting for Easy connection IP 52 - IP 65

SPECIAL PROTECTIONS

	Only with EASY IP 65 port connection
M	Stainless steel (INOX) flanges
N	EPOX BLACK varnished flanges

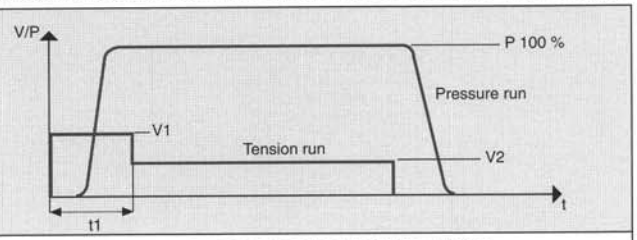
OPERATING PRESSURE

	RANGE	*MODELS*
1	0 - 4 bar	All



ACCESSORIES		
Reference	*Quantity*	*Description*
1	1	PUSH-IN FITTING Ø 10
2	2	PUSH-IN FITTING Ø 10/8/6
3	1	SILENCER
NOTE: Inch size available		

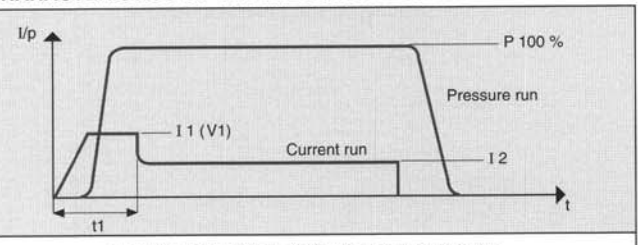
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC

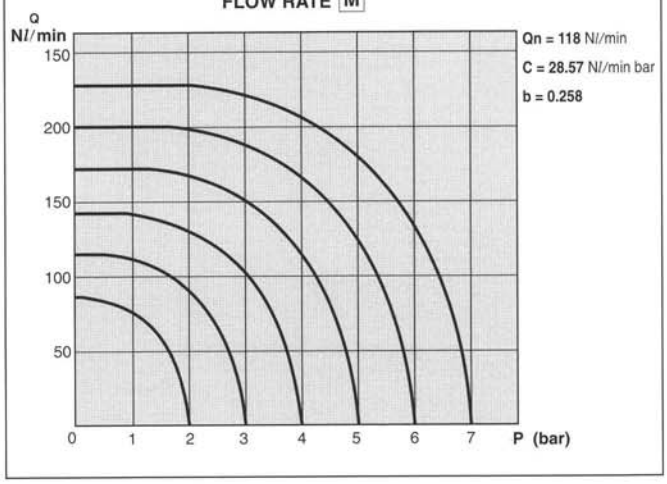
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

I 1 = 0.7 A	t 1 = 2 ms	I 2 = 0.3 A

FLOW RATE M

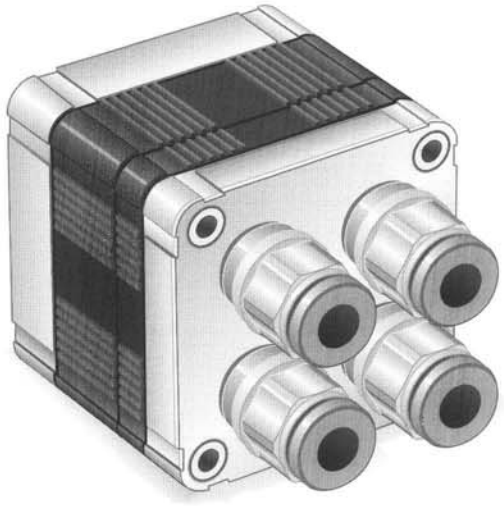


ELECTRICAL PORT CONNECTION

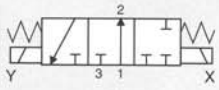
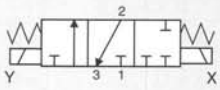
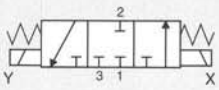
COLOUR	8 CONTROLS (OUTLET)
BLACK	COMMON
BROWN	1 (1)
RED	2 (1)
ORANGE	3 (1)
YELLOW	4 (1)
GREEN	5 (2)
BLUE	6 (2)
VIOLET	7 (2)
GREY	8 (2)

754 • 3/3

NC-NO



CONTROL:	DIRECT	PFM	PNM	PWM

FUNCTION A	FUNCTION C	FUNCTION D
		

GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)		
FILTRATION RATING	Min 40 micron		
TEMPERATURE	– 10 + 50°C (Standard version)		
RESPONSE TIME IN OPENING	12 / 24 < 7 ms	JJ < 5 ms	XX / KK < 2 ms
RESPONSE TIME IN CLOSING	12 / 24 < 3 ms	JJ < 2 ms	XX / KK < 2 ms
MAXIMUM FREQUENCY	100 Hz	200 Hz	300 Hz
WEIGHT	340 g		
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles		
IP RATING	IP 52 - IP 62 - IP 65		

IDENTIFICATION CODE

	M	K	7	5	4	8	E	1	A	2	24

NUMBER OF POSITIONS

K	3 Positions

OUTLETS

4	4 Outlets

FUNCTIONS

A	Outlet NO - Exhaust NC
C	Outlet NC - Exhaust NO
D	Outlet NC - Exhaust NC

FLOW RATE (at 6 bar)

H	50 Nl/min
B	80 Nl/min
M	100 Nl/min (control tension JJ XX KK)

TYPE

2	4 Pairs 2/2

VERSION

	Standard
H	HNBR Shutters

CONTROL TENSION

12	12 VDC ± 10 %	ED 100 %	2.9 W
24	24 VDC ± 10 %	ED 100 %	2.5 W
JJ	24 VDC ± 10 %	ED 100 % (1)	3.8 W
XX	Speed-up in current	ED 100 % (1)	—
KK	Speed-up in tension	ED 100 % (1)	—

(1) Only with Electronic Driver Boards PRB or UDB

No. ELECTRICAL CONTROLS

8	8 Controls
D	8 Controls / Integrated diodes with common
G	8 Controls / Integrated diodes with common 12 / 24

PORT CONNECTION

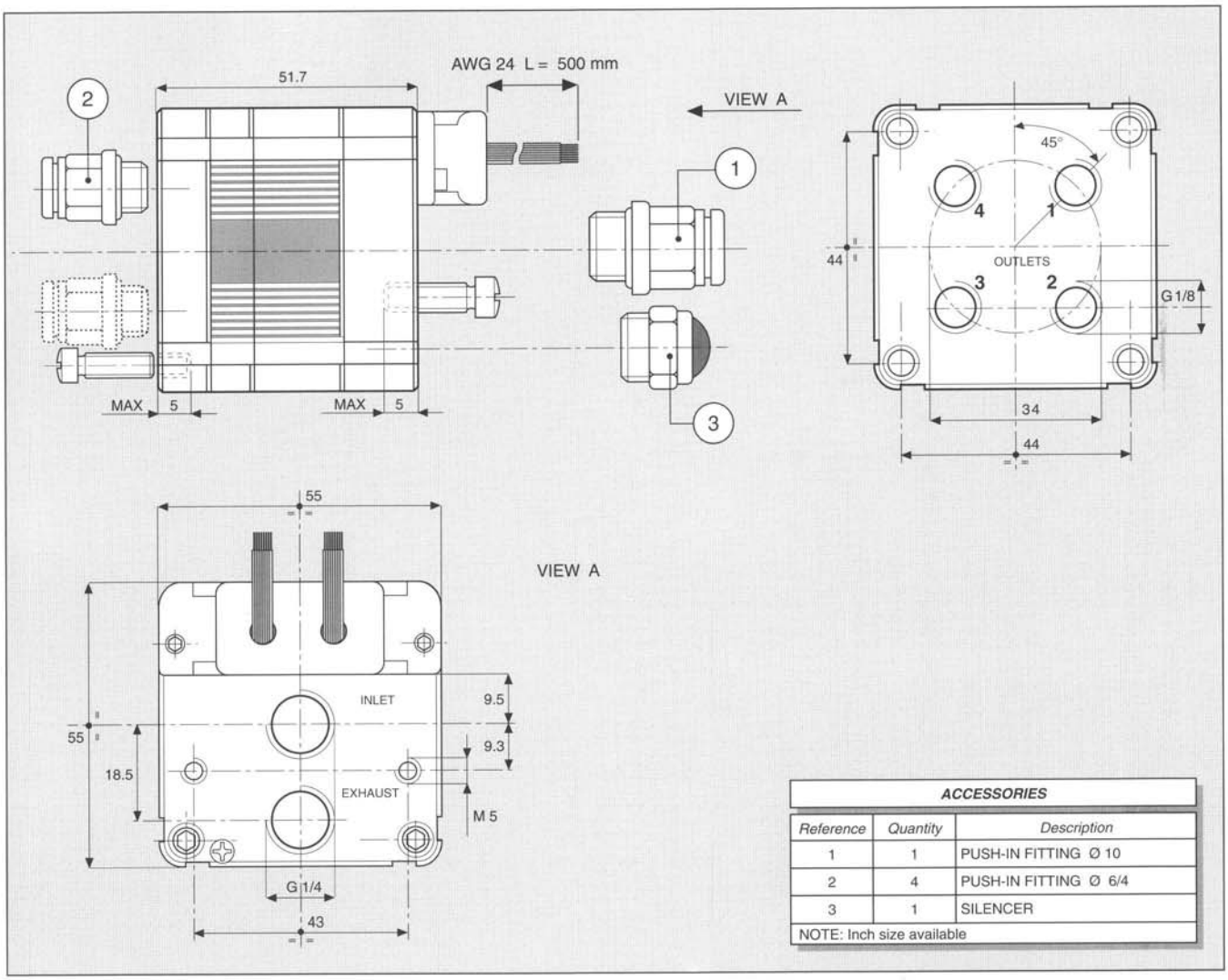
0	Integrated cables IP 62 L = 500 mm
E	Presetting for Easy connection IP 52 - IP 65

SPECIAL PROTECTIONS

	Only with EASY IP 65 port connection
M	Stainless steel (INOX) flanges
N	EPOX BLACK varnished flanges

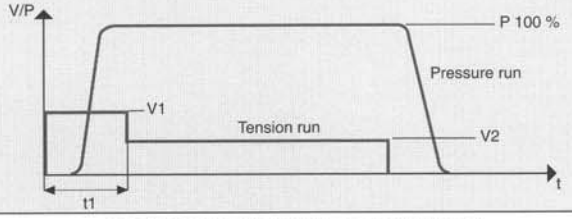
OPERATING PRESSURE

	RANGE	*MODELS*
1	0 - 4 bar	All



ACCESSORIES		
Reference	*Quantity*	*Description*
1	1	PUSH-IN FITTING Ø 10
2	4	PUSH-IN FITTING Ø 6/4
3	1	SILENCER
NOTE: Inch size available		

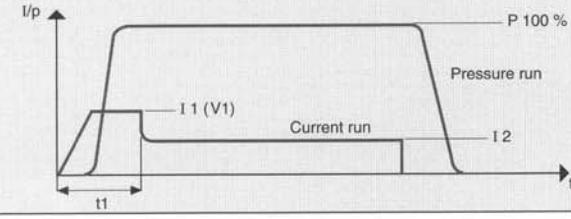
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC

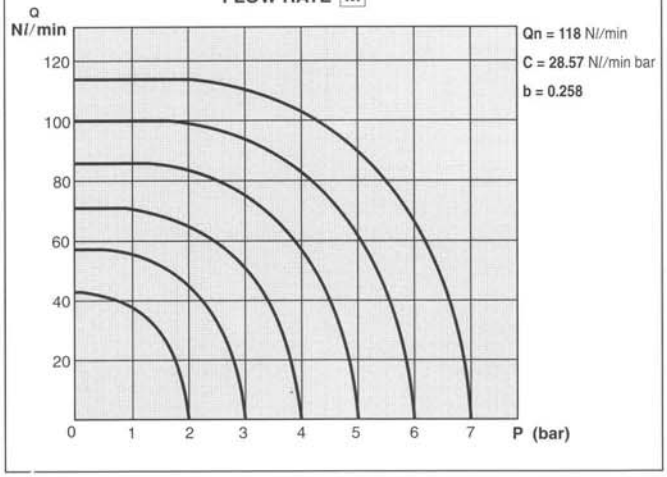
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

I 1 = 0.7 A	t 1 = 2 ms	I 2 = 0.3 A

FLOW RATE M



ELECTRICAL PORT CONNECTION

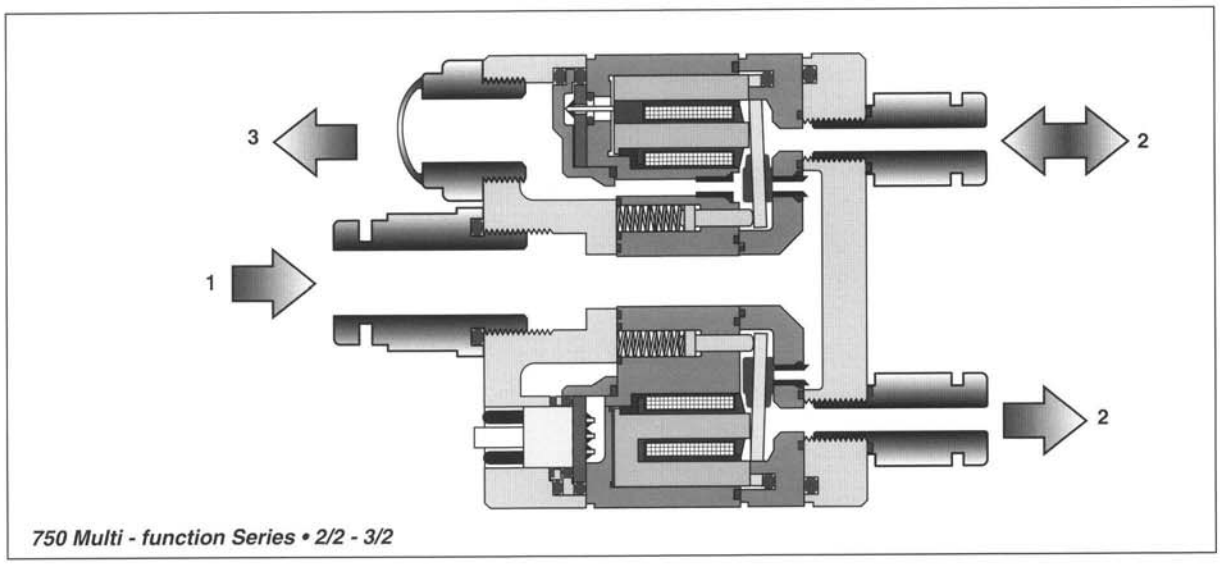
COLOUR	8 CONTROLS (OUTLET)
BLACK	COMMON
BROWN	1 (1)
RED	2 (1)
ORANGE	3 (2)
YELLOW	4 (2)
GREEN	5 (3)
BLUE	6 (3)
VIOLET	7 (4)
GREY	8 (4)

S.V. 750 MULTI - FUNCTION SERIES • 2/2 - 3/2

750 multi-function Series encloses 8 separately controlled shutters in a single body. Its base version has 8 outputs with the following configurations:

- four 3/2 NC outlets four 3/2 NC outlets.
- two 2/2 NC outlets.
- two 2/2 NO inverted flow outlets.

The extreme modularity of 750 Series allows the arrangement of an almost unlimited number of customized configurations. For this aim, contact you local dealer or MATRIX technical staff.
750 multi-function Series is particularly fit for the control of intricate pneumatic system, where different functions are integrated.
In the present model, all the innovations offered by Matrix technology (this combines special dynamic performance to the simplicity and reliability of manufacture) are present. Response times are of millisecond range, while operation life is over 500 million cycles.
With a speed-up kind control, dynamic characteristics are even more improved. Standard 12/24 VDC control solenoid valves have a response time lower than 5 ms in opening and than 2 ms in closing, with a maximum operation frequency 200 Hz. Speed-up control solenoid valves have a response time lower than 2 ms both in opening and in closing, with a maximum operation frequency of 300 Hz.
Besides high-speed characteristics, 750 Series solenoid valves offer flow rate values up to 100 ℓ/minute (ANR) for every single outlet, with feeding (supply) pressure from 0 to 8 bar.
For 750 multi-function series, a lot of accessories is available, such as IP 52 or IP 56 connectors, manifolds with different positions and speed-up driver boards.



750 Multi - function Series • 2/2 - 3/2

Advantages

- Compact dimension.
- Short response times.
- Insensitivity to frequency work and to vibrations.
- Low absorbed power.
- Precision, repetitiveness and flexibility.
- Long operating life.

Applications

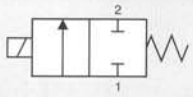
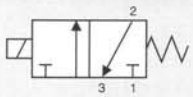
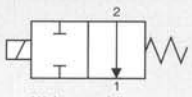
- Process and precision instrumentation.
- Pressure and flow rate control devices.
- Positioning systems.
- Biomedical and measure sector.
- Robotics and industrial automation.

Materials

- Body in PPS.
- Flanges in Al.
- Seals in NBR (shutters in HNBR if required).

758 MULTI-FUNCTION • 2/2 - 3/2 NC-NO

CONTROL:	DIRECT	PFM	PWM	

N. 2 NC	N. 4 NC	N. 2 NA (1)
		

(1) Inverted flow

GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gases (–10 + 50°C)	
FILTRATION RATING	Min 40 micron	
TEMPERATURE	– 10 + 50°C (Standard version)	
RESPONSE TIME IN OPENING	12 / JJ < 5 ms	KK < 2 ms
RESPONSE TIME IN CLOSING	12 / JJ < 2 ms	KK < 2 ms
MAXIMUM FREQUENCY	200 Hz	300 Hz
WEIGHT	350 g	
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles	
IP RATING	IP 52 - IP 62 - IP 65	

IDENTIFICATION CODE

	H	X	7	5	8	8	E	2	R	R	K K

OUTLETS

8	8 Outlets

FUNCTIONS

R	N.6 NC N.2 NO

FLOW RATE (at 6 bar)

H	50 Nl/min
B	80 Nl/min
M	100 Nl/min (ontrol tension JJ XX KK)

TYPE

R	N.4 3/2 - N.2 2/2 N.2 2/2 Inverted flow

VERSION

	Standard
H	HNBR Shutters

CONTROL TENSION

12	12 VDC ± 10 %	ED 100 %	1.4 W
JJ	24 VDC ± 10 %	ED 100 % (1)	1.9 W
KK	Speed-up in tension	ED 100 % (1)	—

(1) Only with Electronic Driver Boards PRB or UDB

No. ELECTRICAL CONTROLS

8	8 Controls

OPERATING PRESSURE

	RANGE	*MODELS*
1	0 - 4 bar	All
2	4 - 8 bar	All
3	0 - 8 bar	..... KK
8	2 - 6 bar	All

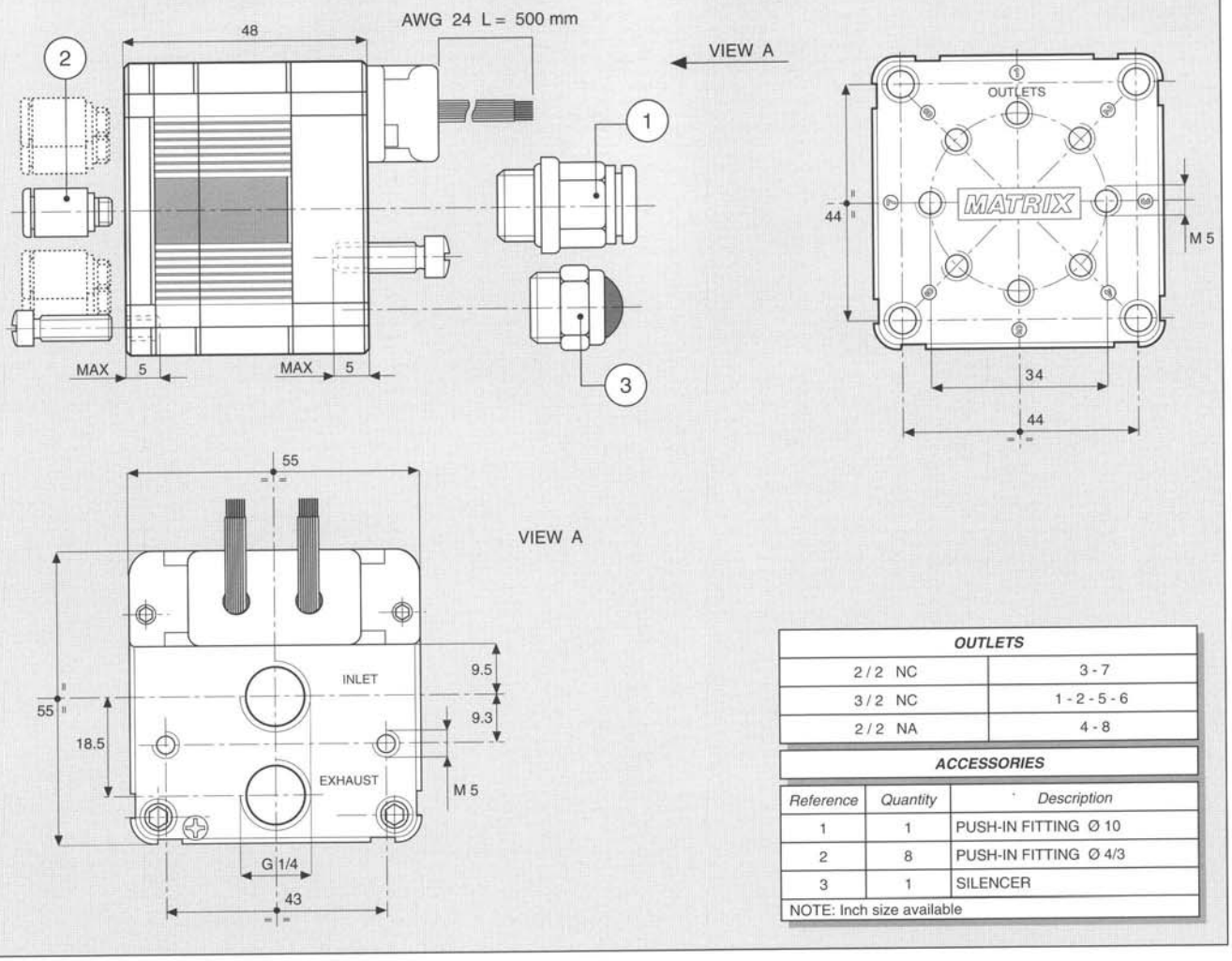
PORT CONNECTION

0	Integrated cables IP 62 L = 500 mm
E	Presetting for Easy connection IP 52 - IP 65

SPECIAL PROTECTIONS

Only with EASY IP 65 port connection	
M	Stainless steel (INOX) flanges
N	EPOX BLACK varnished flanges

758 MULTI-FUNCTION • 2/2 - 3/2



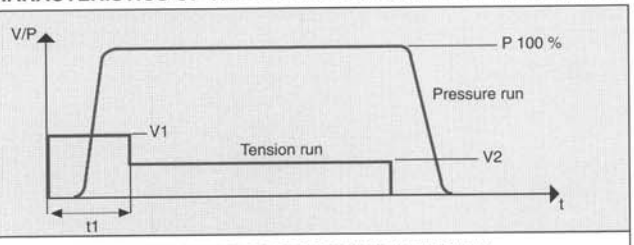
OUTLETS	
2 / 2 NC	3 - 7
3 / 2 NC	1 - 2 - 5 - 6
2 / 2 NA	4 - 8

ACCESSORIES

Reference	Quantity	Description
1	1	PUSH-IN FITTING Ø 10
2	8	PUSH-IN FITTING Ø 4/3
3	1	SILENCER

NOTE: Inch size available

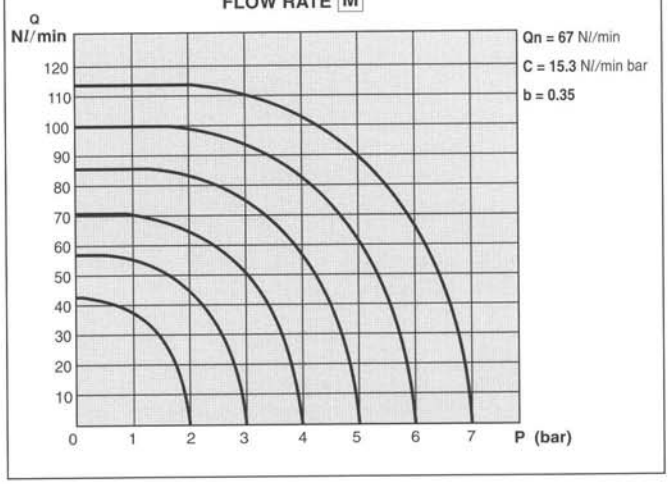
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC

FLOW RATE M



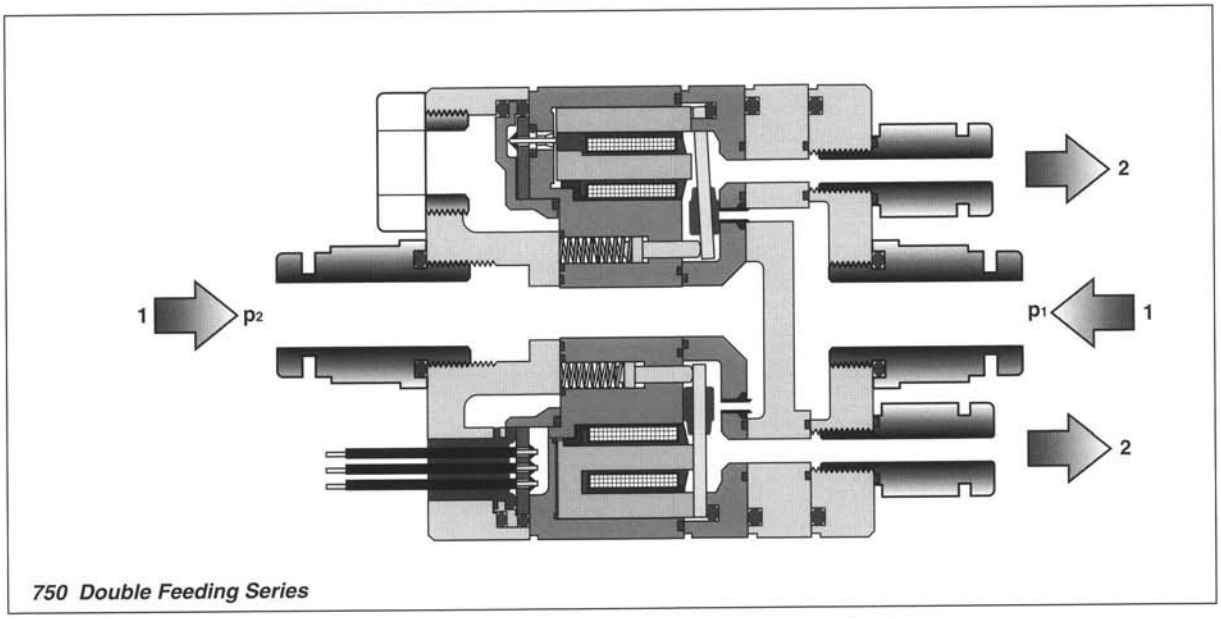
ELECTRICAL PORT CONNECTION

	COLOUR	OUTLET
BLACK 1 - 2	BROWN	1 3 / 2 NC
	RED	2 3 / 2 NC
	ORANGE	3 2 / 2 NC
	YELLOW	4 2 / 2 NA (1)
BLACK 3 - 4	GREEN	5 3 / 2 NC
	BLUE	6 3 / 2 NC
	VIOLET	7 2 / 2 NC
	GREY	8 2 / 2 NA (1)
	BLACK	COMMON

(1) Inverted flow

S.V. 750 DOUBLE FEEDING SERIES • 2/2

750 Series Double Feeding 2/2 encloses in a single body eight shutters, having NC configuration. This Series is characterized by two separated inputs, providing for the feeding of the 1, 3, 5, 7 outlets (feeding p_1) and 2, 4, 6, 8 outlets (feeding p_2). Such a configuration allows the management, in a small-sized compact single body, two groups of pneumatic users at differentiate pressure.
In the present model, all the innovations offered by Matrix technology (this combines special dynamic performance to the simplicity and reliability of manufacture) are present. Response times are of millisecond range, while operation life is over 500 million cycles.
With a speed-up kind control, dynamic characteristics are even more improved. Standard 24 VDC control solenoid valves have a response time lower than 5 ms in opening and than 2 ms in closing, with a maximum operation frequency 200 Hz. Speed-up control solenoid valves have a response time lower than 2 ms both in opening and in closing, with a maximum operation frequency of 300 Hz.
Besides high-speed characteristics, 750 Series solenoid valves offer flow rate values up to 100 ℓ/minute (ANR) for every single outlet, with feeding pressure from 0 to 4 bar.
For 750 series, a lot of accessories is available, such as IP 52 or IP 56 connectors, manifolds with different positions and speed-up driver boards.



750 Double Feeding Series

Advantages

- Compact dimension.
- Short response times.
- Insensitivity to frequency work and to vibrations.
- Low absorbed power.
- Precision, repetitiveness and flexibility.
- Long operating life.

Applications

- Process and precision instrumentation.
- Robotics and industrial automation.
- Positioning systems.
- Pilot systems.

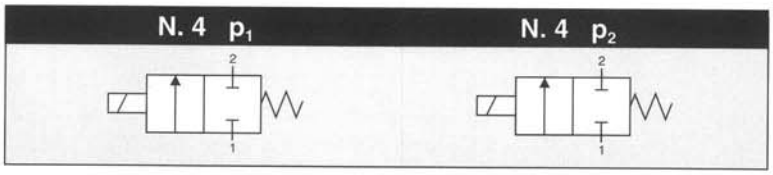
Materials

- Body in PPS.
- Flanges in Al.
- Seals in NBR (shutters in HNBR if required).

758 DOUBLE FEEDING • 2/2

NC

CONTROL: DIRECT



GENERAL CHARACTERISTICS

FLUID	Non-lubricated dry air, neutral gasesi (–10 + 50°C)		
FILTRATION RATING	Min 40 micron		
TEMPERATURE	– 10 + 50°C (Standard version)		
RESPONSE TIME IN OPENING	12 / 24 < 7 ms	JJ < 5 ms	XX / KK < 2 ms
RESPONSE TIME IN CLOSING	12 / 24 < 3 ms	JJ < 2 ms	XX / KK < 2 ms
MAXIMUM FREQUENCY	100 Hz	200 Hz	300 Hz
WEIGHT	350 g		
PRODUCT LIFE EXPECTANCY	≥ 500 M/s cycles		
IP RATING	IP 52 - IP 62 - IP 65		

IDENTIFICATION CODE

	H	X	7	5	8	8	E	Z	C	2	24

OUTLETS

8	8 Outlets

FUNCTION

C	NC

FLOW RATE (at 6 bar)

H	50 Nl/min
B	80 Nl/min
M	100 Nl/min (control tension JJ XX KK)

TYPE

2	2/2

VERSION

	Standard
H	HNBR Shutters

CONTROL TENSION

12	12 VDC ± 10 %	ED 100 %	1.4 W
24	24 VDC ± 10 %	ED 100 %	1.2 W
JJ	24 VDC ± 10 %	ED 100 % (1)	1.9 W
XX	Speed-up in current	ED 100 % (1)	—
KK	Speed-up in tension	ED 100 % (1)	—

(1) Only with Electronic Driver Boards PRB or UDB

No. ELECTRICAL CONTROLS

8	8 Controls
D	8 Controls / Integrated diodes with common 0 V
G	8 Controls / Integrated diodes with common 12 / 24 V

OPERATING PRESSURE

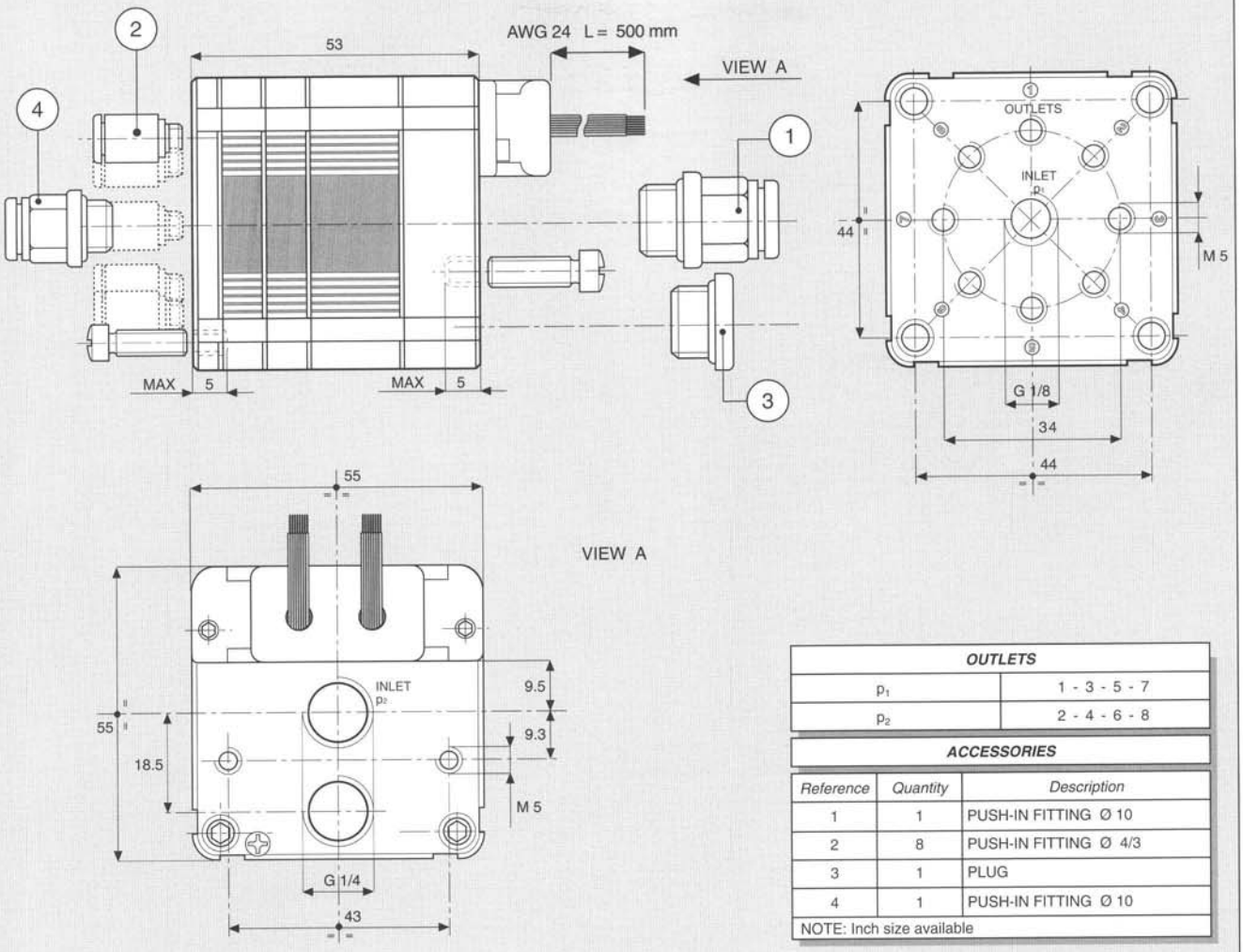
	RANGE	*MODELS*
Z	p_1 0 - 4 bar p_2 4 - 8 bar	All
X	On demand	Custom

PORT CONNECTION

0	Integrated cables IP 62 L = 500 mm
E	Presetting for Easy connection IP 52 - IP 65

SPECIAL PROTECTIONS

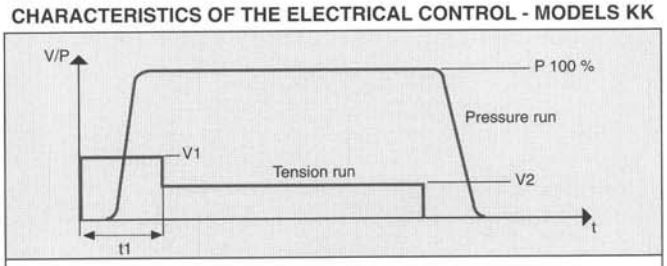
	Only with EASY IP 65 port connection
M	Stainless steel (INOX) flanges
N	EPOX BLACK varnished flanges



OUTLETS	
p_1	1 - 3 - 5 - 7
p_2	2 - 4 - 6 - 8

ACCESSORIES		
Reference	*Quantity*	*Description*
1	1	PUSH-IN FITTING Ø 10
2	8	PUSH-IN FITTING Ø 4/3
3	1	PLUG
4	1	PUSH-IN FITTING Ø 10
NOTE: Inch size available		

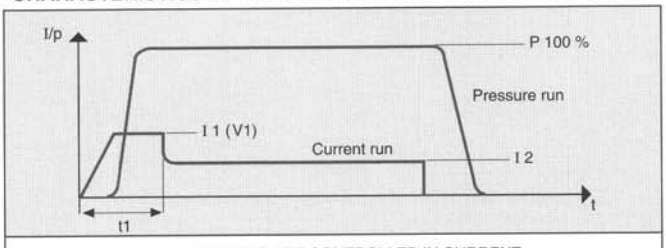
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC

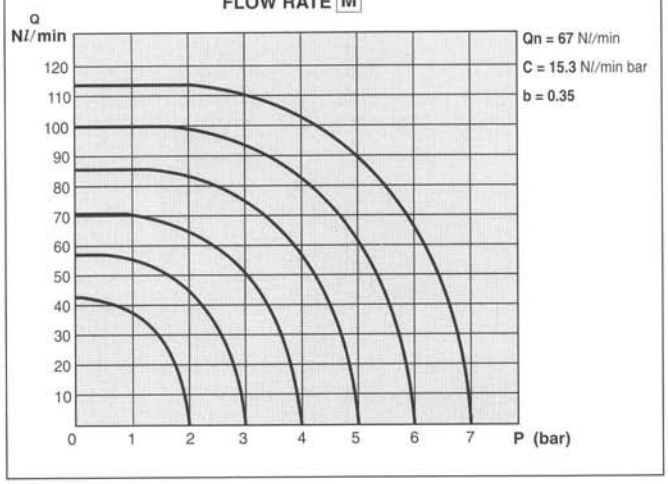
CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS XX



N.B. XX MODELS ARE CONTROLLED IN CURRENT

I 1 = 0.7 A	t 1 = 2 ms	I 2 = 0.3 A

FLOW RATE M

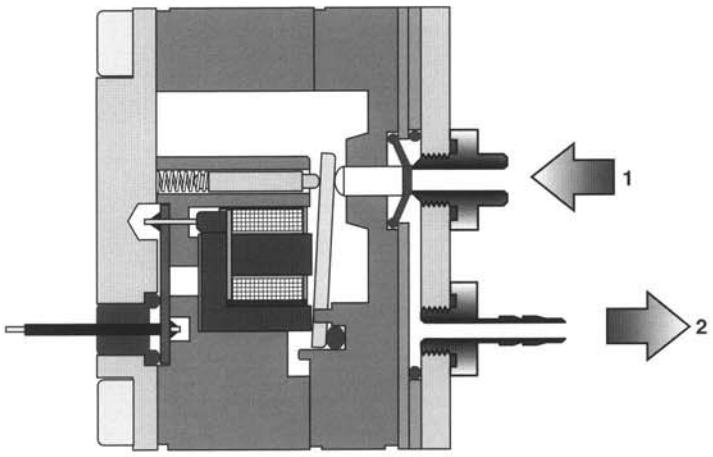


ELECTRICAL PORT CONNECTION

COLOUR	8 CONTROLS
BLACK	COMMON
BROWN	1
RED	2
ORANGE	3
YELLOW	4
GREEN	5
BLUE	6
VIOLET	7
GREY	8

S.V. 630 DIAPHRAGM SERIES • 2/2

Pneumatic solenoid valves of 630 Diaphragm Series are of 2/2 NC type and particularly suitable for conditioning of fluids. They are equipped with diaphragm shutter and stainless steel inner room. The mass of moving elements has been reduced at minimum. Every inner friction has been eliminated, obtaining in this way response time of millisecond range.
Due to the sped-up control, response times, both in opening and in closing, are lower than 5 ms and the maximum operating frequency is 100 Hz (with dry non-lubricated air).
Besides these characteristics, solenoid valves of 630 diaphragm Series have a flow path diameter of 1,5 mm, which enable operation pressure to 3 bar.
Controlling the solenoid valve with PWM (Pulse Width Modulation) or PFM (Pulse Frequency Modulation) is possible to vary the passant flow rate, obtaining in this way a flow proportional solenoid valve. 630 Series is available both in line assembly version and on sub-plate (see item "Accessories, Manifolds 630 Series").



630 Diaphragm series • 2/2

Advantages

- Compact dimension.
- High duct section.
- Short response times.
- Insensitivity both to frequency work and to vibrations.
- Low absorbed power.
- High precision and repetitiveness.
- Long operating life.

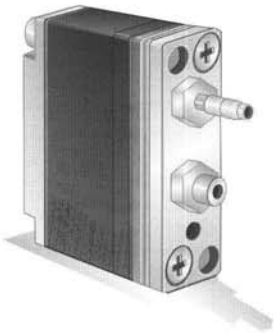
Applications

- Biomedical and measure sector.
- Metering systems.
- Precision and flow rate control devices.

Materials

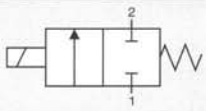
- Chamber in INOX Aisi 304
- Nozzle in nickel-plated brass.
- Seals in NBR.

630 DIAPHRAGM SERIES • 2/2 NC



CONTROL:	DIRECT	PFM	PWM	

N. 1 NC



GENERAL CHARACTERISTICS

FLUID	All fluids compatible with following materials: NBR Rubber - INOX AISI 304 - NICHEL
FILTRATION RATING	Min 40 micron
TEMPERATURE	0 + 50°C
RESPONSE TIME IN OPENING	KK < 5 ms
RESPONSE TIME IN CLOSING	KK < 5 ms
MAXIMUM FREQUENCY	100 Hz - Non-lubricated dry air
WEIGHT	45 g
PRODUCT LIFE EXPECTANCY	≥ 100 M/s cycles
IP RATING	IP 62

IDENTIFICATION CODE

	W	X	6	3	1	1	0	5	C	2	K K

OUTLETS

1	1 Outlet

FUNCTION

C	NC

ORIFICE

W	Ø eq 1.5 mm

TYPE

2	2/2

VERSION

	Body ported
D	Manifold

CONTROL TENSION

KK	Speed-up in tension	0.85 W

No. ELECTRICAL CONTROLS

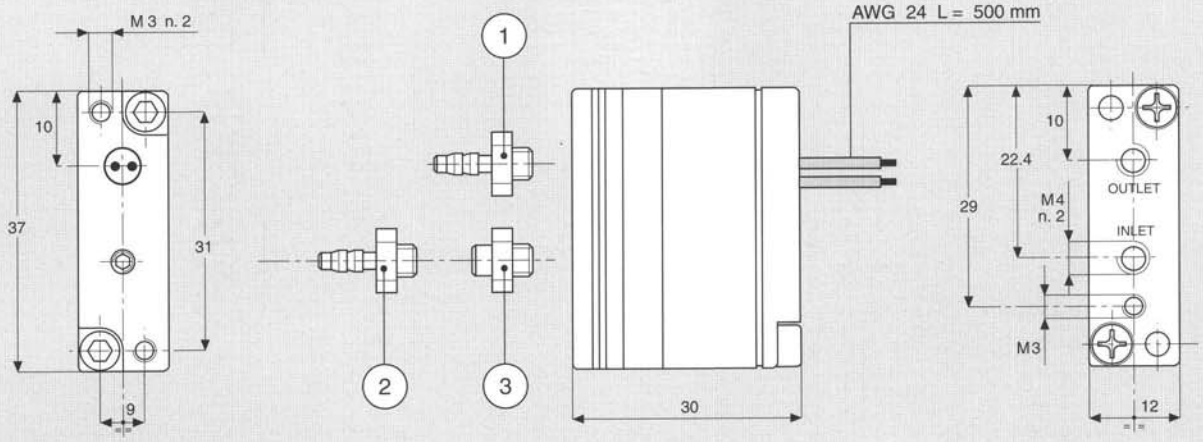
1	1 Control

OPERATING PRESSURE

	RANGE	*MODEL*
5	0 - 3 bar	All

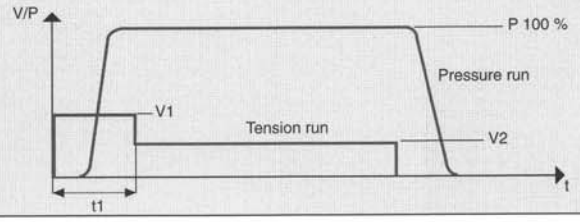
PORT CONNECTION

0	Integrated cables IP 62 L = 500 mm



ACCESSORIES		
Reference	*Quantity*	*Description*
1	1	BARBED FITTING FOR FLEXIBLE TUBE Ø 2
2	1	BARBED FITTING FOR FLEXIBLE TUBE Ø 2 (Body ported)
3	1	PROBE PUSH - FITTING (manifold)

CHARACTERISTICS OF THE ELECTRICAL CONTROL - MODELS KK



N.B. KK MODELS ARE CONTROLLED IN TENSION

V 1 = 24 VDC	t 1 = 2 ms	V 2 = 5 VDC

ELECTRONIC PRESSURE REGULATOR

EPR 100 - Electronic pressure regulator.
The Matrix EPR 100 is an electronic pressure regulator, equipped with the latest-generation 8 bit microcontroller. It can process signals and commands, carry out complex functions and communicate with other control systems via a RS-232 serial line. The functional design, ease of use, and integration in advanced systems are characteristics which qualify the EPR 100 as an active component of pneumatic systems. Appropriate programming adapts it quickly to a specific circuit.
The controlling signal, which may be analog or digital (via RS-232 or keypad), is processed by the microcontroller. Information is then converted into a proportional pressure signal by high speed solenoid valves. These valves are controlled in frequncy by a technique known as Pulse Width Modulation (PWM).
An integrated pressure sensor monitors the pressure on the outlet side of the EPR 100 and compares this value to the pressure level required, which is set by the input signal, so that any variation in the pressure can be compensated. This closed loop system has a reaction time of less than 5 ms. The maximum flow rate that the EPR 100 can produce and its high speed, makes its use possible in applications which until now were controlled by more elaborate systems.
When combining the EPR 100 with a high flow mechanical regulator. the functional characteristics are changed into those of a proportional servo valve, with extremely fast response times and high precision even under near maximum flow rate conditions.
As the unit is compact, very hard wearing and insensible to shocks and accelerations. It is ideal for use in severe industrial environments.

The EPR 100 is available in two basic versions :

EPR 100 A controlled by analogic signal or by a RS-232 serial line.

EPR 100 D controlled by RS-232, keypad or analogic control; with visual display of pressure readings.

Advantages

- Integration with analogic or digital control systems (PC, PLC, etc.)
- Display reading of measured pressure data and keypad control (EPR 100 D)
- High flexibility with programmable configuration
- High precision, repeatibility and reliability
- Compact and strong manufacture, case of use and high security
- Low power absorbtion

Applications

- Driving a servo regulator
- Power control for industrial machinery: (actuators, suspensions, welding equipment, clamping devices, laser applications, energizing, braking at pneumatic control, painting, packaging and manufacturing machines, molding machines, batching machines, smoothing machines, cleaning machines, textile loom, test stands, robotics, suspension control, antislipping systems).
- Remote controls
- Processing, precision and calibration equipment.

EPR 100

GENERAL CHARACTERISTICS

DIMENSION	120 x 70 x 40 mm
WEIGHT	400 g
IP RATING	IP 60 (IP 65 on requerest)
PNEUMATIC CONNECTION	G 1/8"
OPERATING TEMPERATURE	-10 - + 50 °C
HANDLED FLUID	filtered, non-lubricated and dry
FILTRATION RATIO	min 5 µm
SUPPLY VOLTAGE	24 VDC ± 10%
MAXIMUM ABSORBED POWER	2 W
CONTROL	0 - 5 V / 0 -10 V / RS-232
MAXIMUM FLOW RATE	60 dm^3 / min (ANR) @ 6 bar
INLET PRESSURE	1 - 8 bar
OULET PRESSURE	0 - 7 bar
REACTION TIME	< 5 ms
RESPONSE TIME (*)	60 ms (1) - 100 ms (2)
SENSIBILITY	< 1 % F.S.
LINEARITY	< 1 % F.S.
HYSTERESIS	< 1 % F.S.
RIPEATABILITY	< 1 % F.S.

(*) Volume 30 cm^3 • @ P = 8 bar • (1) from 2 to 4 bar (rise time)
(2) from 4 to 2 bar (fall time)

IDENTIFICATION CODE

E	P	R	1	0	0	A	0			

VERSION

E	Standard
S	For Booster

CONNECTION

0	15 -Pole D-SUB IP 62 Version 8 bar only
1	11-Pole HIRSCHMANN IP 65 Version 8 bar only
2	6 -Pole HIRSCHMANN IP 65 Version 16 bar only

PRESSURE

0	8 bar
1	16 bar - only for booster

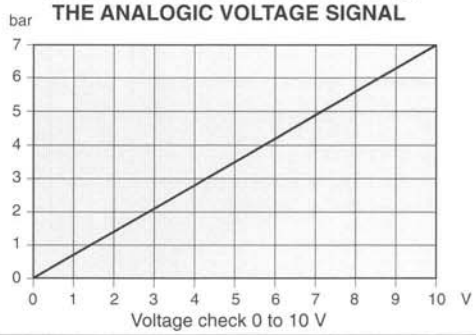
CONTROL

A	Configuration by RS - 232 serial line Configuration by keypad
D	Configuration by RS - 232 serial line Configuration by keypad Control with

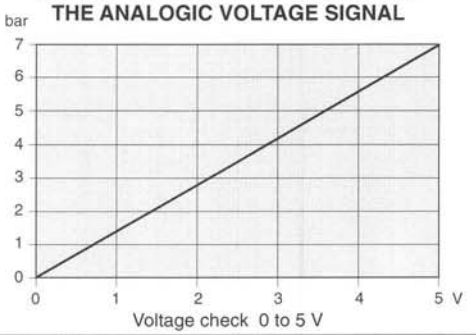
LABEL

0	Version 8 bar
1	Version 16 bar

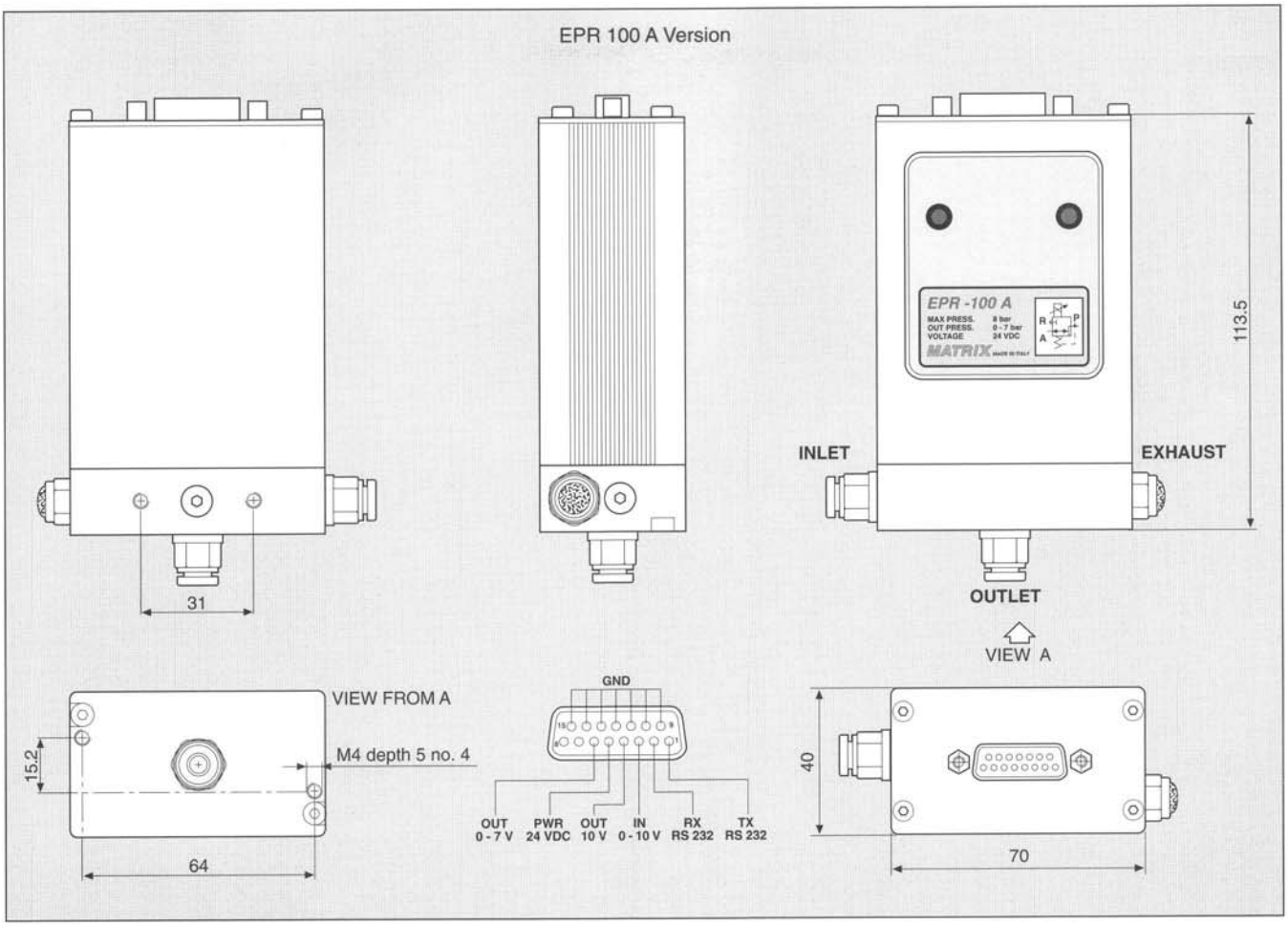
OUTLET PRESSURE ACCORDING TO THE ANALOGIC VOLTAGE SIGNAL



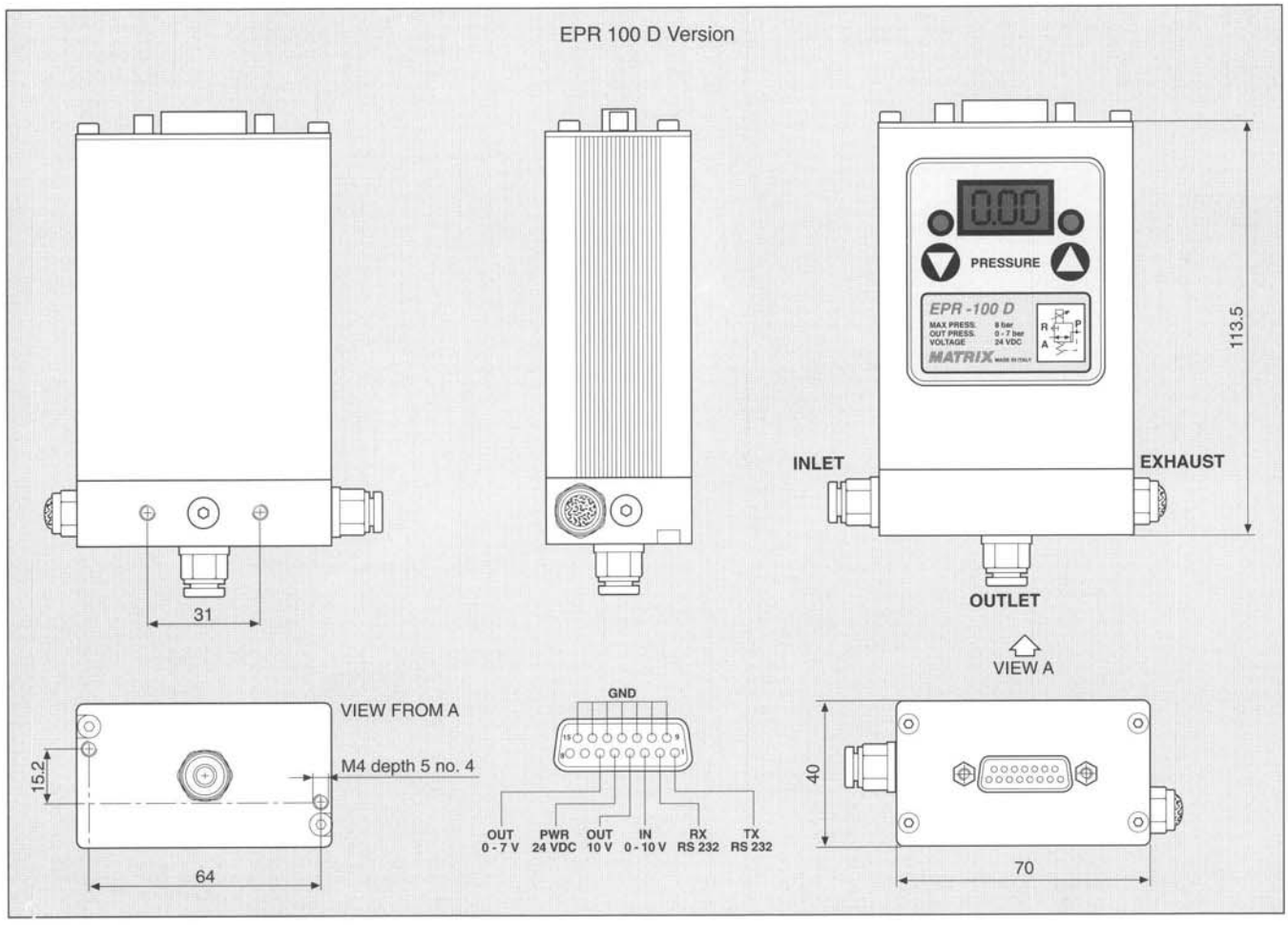
OUTLET PRESSURE ACCORDING TO THE ANALOGIC VOLTAGE SIGNAL



EPR 100 A Version



EPR 100 D Version



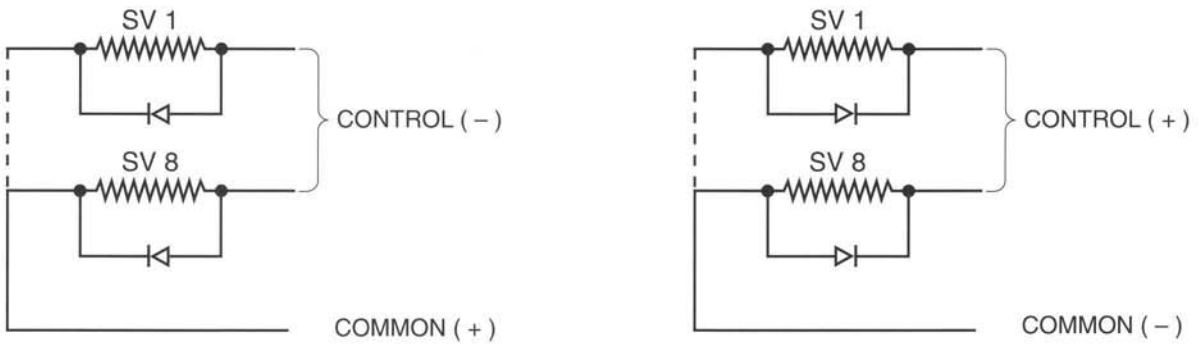
Integrated anti-disturbance diodes (surge voltage suppressor) 750 Series

When you interrupt feeding in an inductive circuit, the magnetic energy stored in the core zeroes. In the spire of the coil, this variation produces a contro-electromotor force, the polarity of which is inverse to that of feeding. In some cases the peak-value of this induced tension can result high and cause electromagnetic disturbance. It can also affect negatively the integrity of the driver and the insulation of the coil itself. The use of anti-disturbance diodes eliminates these phenomena.

Marginal note

Anti-disturbance diodes limit the maximum operative frequency of solenoid valves to 50 Hz.

Electrical scheme. Diode disposition according to control typology.



Models available with anti-disturbance diodes

Almost all 750 series models in the catalogue can be equipped with anti-disturbance diodes which are integrated in the valve.
In this series single control models and all speed-up control versions are an exception.

How to order solenoid valves with anti-disturbance diodes. Control typologies

	H	X	7	5	8	C	E	2	C	3	24

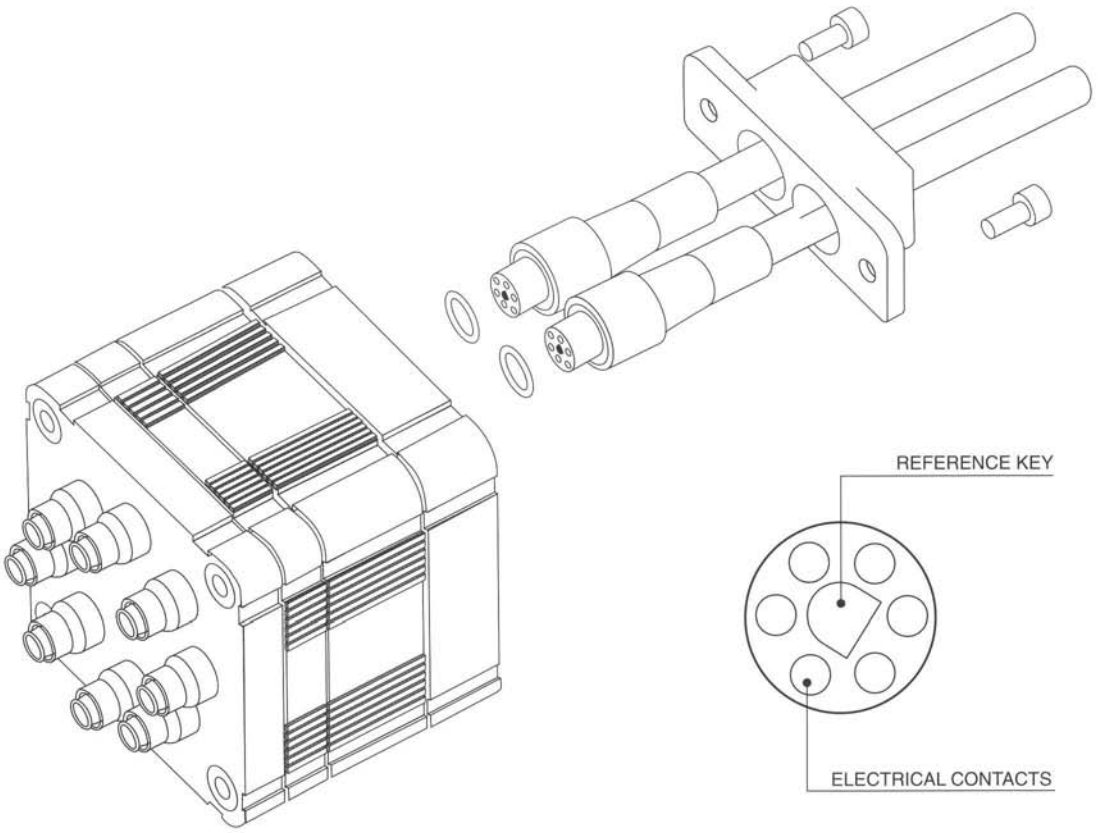
N. ELECTRICAL CONTROLS

C	4 Controls / Integrated diodes with common 0 Volt
D	8 Controls / Integrated diodes with common 0 Volt
F	4 Controls / Integrated diodes with common 12 / 24 Volt
G	8 Controls / Integrated diodes with common 12 / 24 Volt

Matrix Easy electrical port connection - 750 Series

Matrix Easy port connection is suitable to use a wide range of cables which are expressly developed for 750 Series and it allows to obtain different levels of protection according to CEI EN 60947 and CEI 60529 norms.
The port connection also allows a significant simplification of electrical connections, it is consistent with 750 Series manifold and it can interface with expansion modules of this series.

Matrix Easy electrical port connection



Models available with Matrix Easy electrical port connection

750 Series models can be equipped with Matrix Easy electrical port connection (6 poles with reference key).

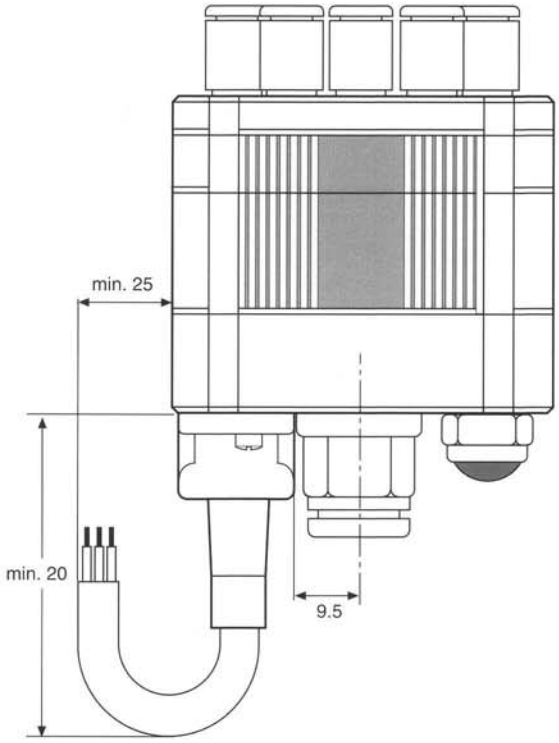
How to order solenoid valves with Matrix Easy electrical port connection.

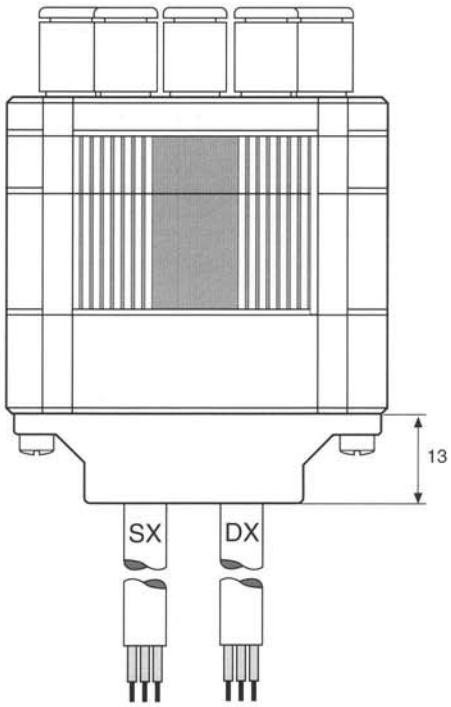
	H	X	7	5	8	8	E	2	C	3	24

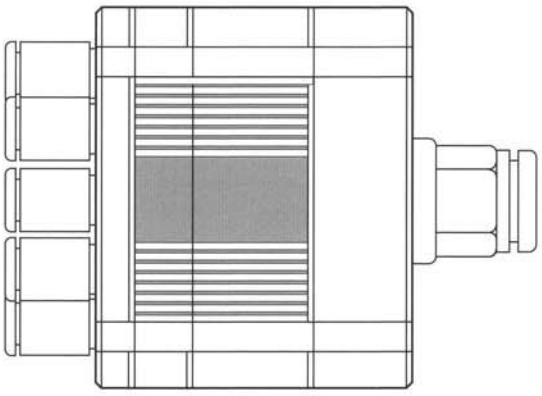
PORT CONNECTION

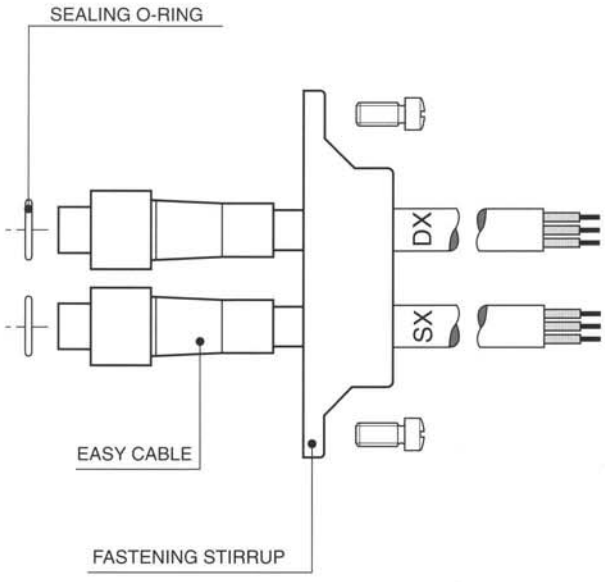
E	Presetting for Easy connection IP 52 - IP 65

Matrix Easy electrical port connection - 750 Series









Easy IP 65 port connection cables - 750 Series

Protection rate means the intrinsic capability of electrical equipment under tension to protect and protect itself against solid bodies and water. Such protection rate is identified with the IP abbreviation followed by 2 numbers whose relative definition is established by CEI EN 60947 and CEI 60529 norms. The first number, from 0 to 6, classifies the protection against solid bodies, the second one, from 0 to 8, the protection against water.
Protection rates of Easy IP 65 port connection cables follow:

Protection rate of coverings against solid bodies and water.		
6	Totally protected against dust	Dust penetration is not admitted
5	Protected against water jets	Water jets thrown on the covering from all directions, must not cause damaging effects.

Models available with IP 65 port connection cables

750 Series models come with Matrix Easy port connection and can be equipped with IP 65 cables.

Characteristics of IP 65 cable - UL 1581 and UL 758 norms	
Type of port connection on valve	Matrix Easy 6 poles
Cable diameter	6.5 mm
Maximum temperature use	105° C for PVC - Class 43 (Style 2517) 80° C for polyurethane (Style 20235)
Insulation	300 Volt
Resistance against oil	ASTM 2 at 60° C

How to order IP 65 port connection cables - Length and endings *(see following page)*

Cables come with assembly kit composed of fastening stirrup, fastening screws and sealing O-rings.
For 4 electrical-control valves the kit is composed of a single cable.
For 8 electrical-control valves the kit is composed of two cables.

ACCESSORIES

1.1 Ending with soldered threads cable - 4 electrical-control valves (1 cable)

Cable length	PVC	POLYURETHANE
1.000 mm	cod. 868.851 J	— — —
2.000 mm	cod. 868.854 M	cod. 868.883 P
3.000 mm	cod. 868.855 N	— — —
4.000 mm	— — —	cod. 868.884 Q

1.2 Ending with soldered threads cable - 8 electrical-control valves (2 cables)

Cable length	PVC	POLYURETHANE
1.000 mm	cod. 868.850 I	— — —
2.000 mm	cod. 868.852 K	cod. 868.885 R
3.000 mm	cod. 868.853 L	— — —
4.000 mm	— — —	cod. 868.886 S

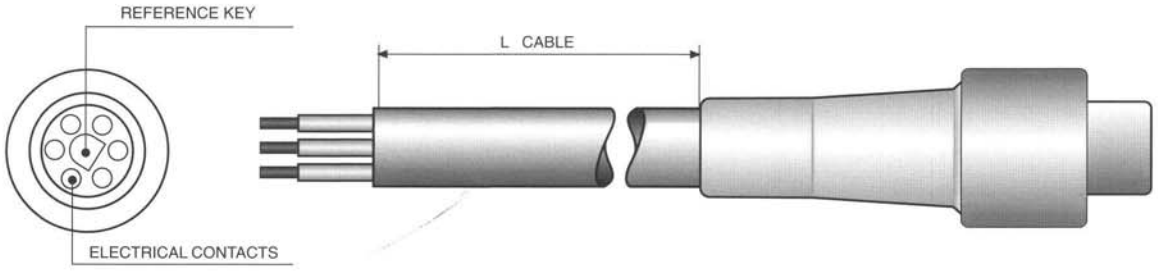
2.1 Ending with Sub-D 15 poles connector - 4 electrical-control valves (2 cables)

Cable length	PVC	
1.000 mm	cod. 868.858 Q	
2.000 mm	cod. 868.859 R	
3.000 mm	cod. 868.861 T	

2.2 Ending with Sub D 15 poles connector - 8 electrical-control valves (2 cables)

Cable length	PVC	
1.000 mm	cod. 868.856 O	
2.000 mm	cod. 868.857 P	
3.000 mm	cod. 868.860 S	

Easy IP 65 port connection cables (IP protection according to CEI EN 60947 and CEI 60529 norms)



Easy IP 52 port connection cables - 750 Series

This series guarantees an IP 52 protection level according to CEI EN 60947 and CEI 60529 norms and it is consistent with all 750 Series models that come with Matrix Easy port connection.
Protection rates of Easy IP 52 port connection cables follow:

Protection rate of coverings against solid bodies and water

5	Protected against dust	Dust penetration is not totally excluded but dust must not penetrate in such a quantity that could damage the good working of the equipment or jeopardise its safety.
2	Protected against vertical fall of water drops with an inclination of the covering until 15°.	The water drops which fall vertically must not cause damaging effects when the covering is inclined until 15° in comparison with its vertical position.

Characteristics of IP 52 cable - UL 1569 norms

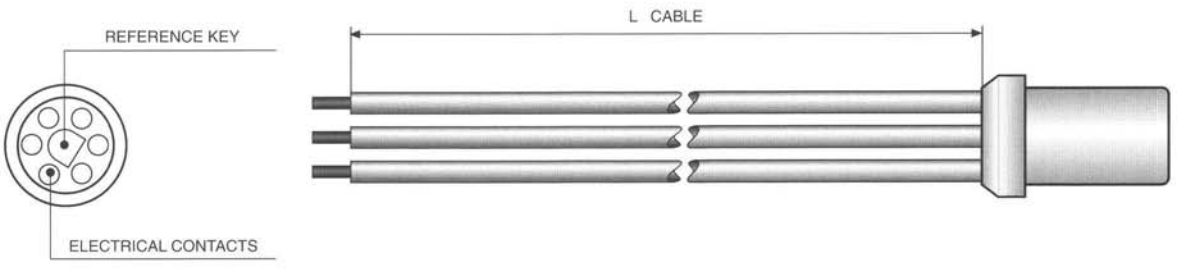
Type of port connection on valve	Matrix Easy 6 poles
Threads diameter	1.4 mm
Conductor diameter	AWG 24
Maximum temperature use	105° C
Insulation	300 Volt
Covering threads	PVC (polyvinyl chloride)

How to order Easy IP 52 port connection cables - Available lengths

Ending with soldered threads cable - 2, 4 and 8 electrical control valves

Cable length	2 Controls	4 Controls	8 Controls
500 mm	cod. 868.870 C	cod. 868.871 D	cod. 868.872 E
1.000 mm	cod. 868.873 F	cod. 868.875 H	cod. 868.877 J
2.000 mm	cod. 868.874 G	cod. 868.876 I	cod. 868.878 K
3.000 mm	cod. 868.845 D	cod. 868.880 M	cod. 868.881 N

Easy IP 52 port connection cable (IP protection according to CEI EN 60947 and CEI 60529 norms)



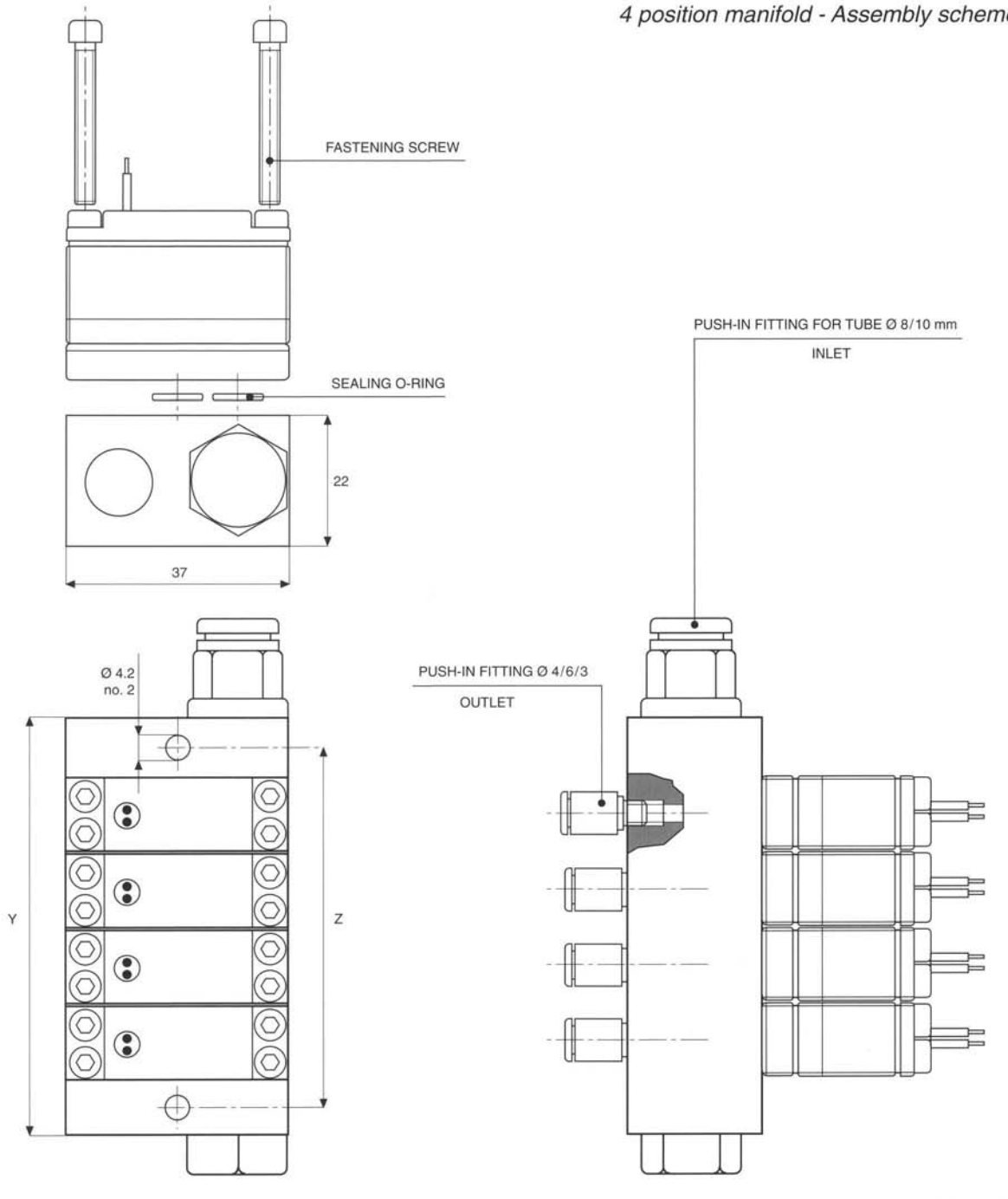
Manifold - 820 Series

Manifolds for multiple installing represent a fast and safe system of connection for all 820 Series models. Manifolds are available in patterns for 4 and 8 solenoid valves. They come in a kit with fastening screws, inlet push-in fittings, closure plug and sealing O-Rings.

How to order manifolds - Available patterns

Pattern	Kit code	Y (mm)	Z (mm)
no. 4 Solenoid valves	820.041 B	70	60
no. 8 Solenoid valves	820.042 C	120	110

4 position manifold - Assembly scheme



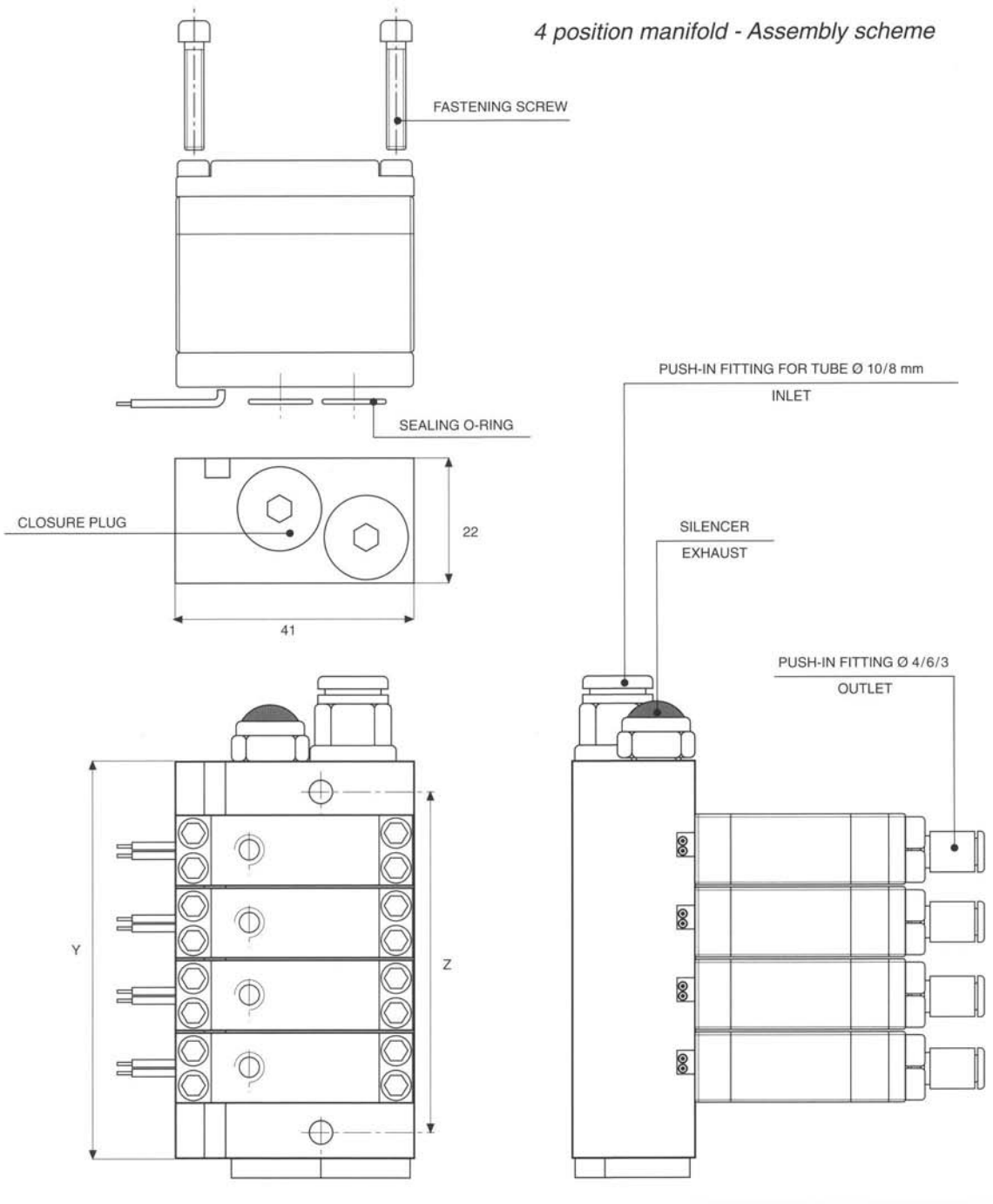
Manifold - 720 Series

Manifolds for multiple installing represent a fast and safe system of connection for all 720 Series models. Manifolds are available in patterns for 4 and 8 solenoid valves. They come in a kit with fastening screws, inlet push-in fittings, closure plug and sealing O-Rings.

How to order manifolds - Available patterns

Pattern	Kit code	Y (mm)	Z (mm)
no. 4 Solenoid valves	861.310 I	70	60
no. 8 Solenoid valves	861.321 T	120	110

4 position manifold - Assembly scheme



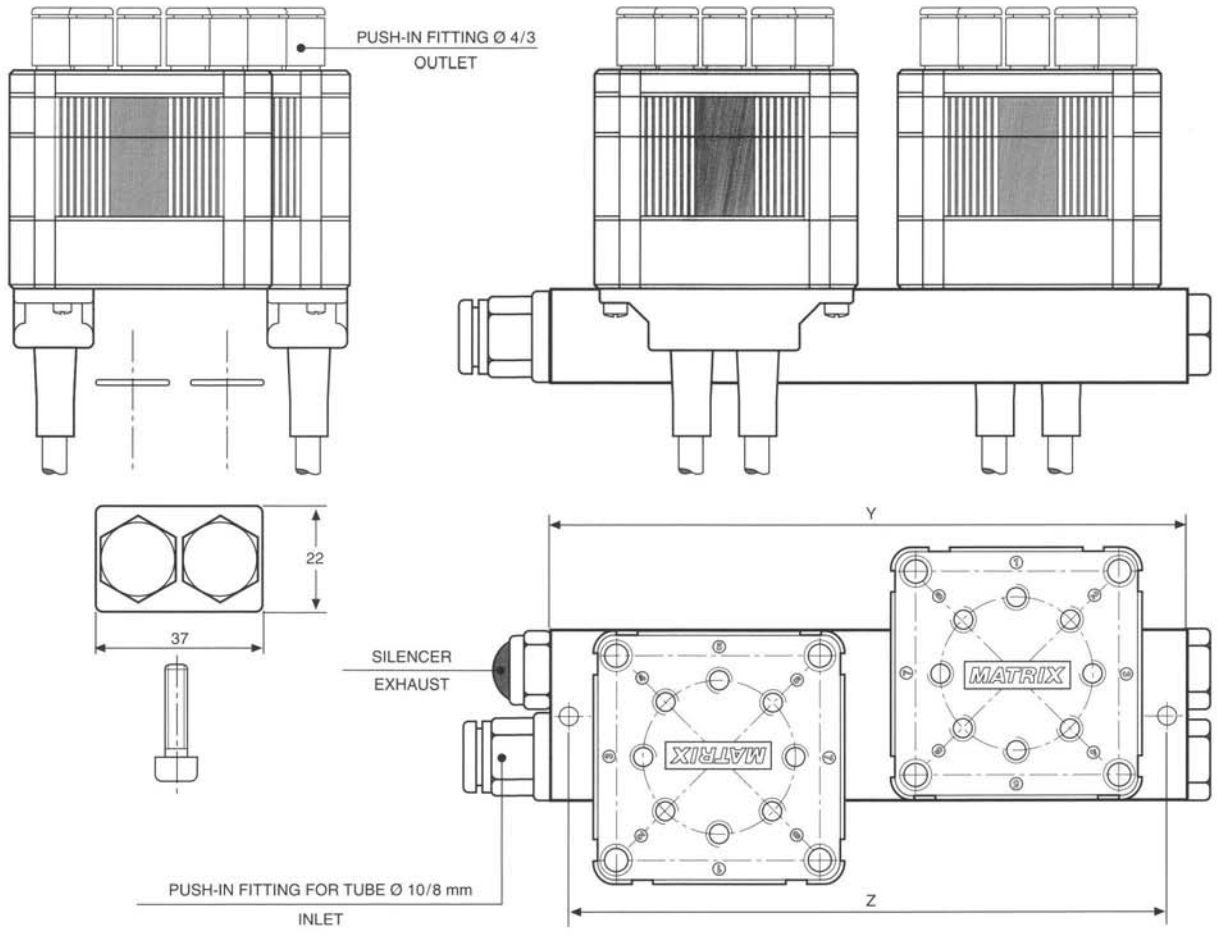
Manifold - 750 Series

Manifolds for multiple installing represent a fast and safe system of fastening and connection for all 750 Series models.
They are suitable for the rationalisation of complex pneumatic systems thanks to their simplicity of the assembly and their total modularity.
Manifolds are available for patterns from 2 to 8 solenoid valves of 750 series and are consistent with Matrix Easy electrical port connection and cables. They come in kit with fastening screws, push-in fittings and sealing O-Rings.

How to order Manifolds - Available patterns

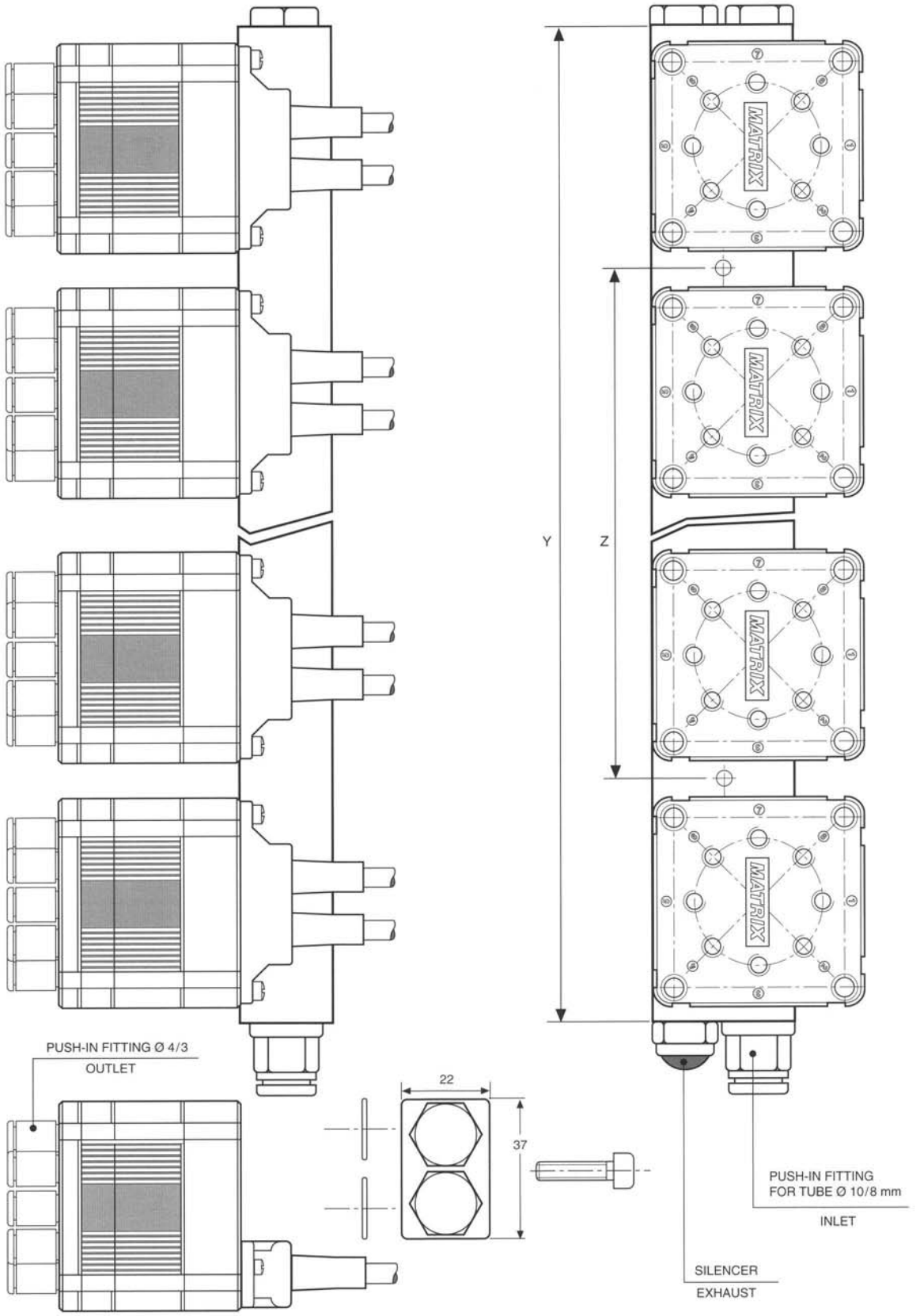
Pattern	Kid code	Y (mm)	Z (mm)
no. 2 Solenoid valves	868.950 E	140	130
no. 3 Solenoid valves	868.951 F	195	65
no. 4 Solenoid valves	868.952 G	260	130
no. 5 Solenoid valves	868.953 H	325	195
no. 6 Solenoid valves	868.954 I	390	260
no. 7 Solenoid valves	868.955 J	455	325
no. 8 Solenoid valves	868.956 K	520	390

2 position manifold. Assembly example of a 750 NC model and a 750 NO model



Manifold - 750 Series

3,4,5,6,7,8 position manifolds.
See previous scheme for Y and Z dimensions and relative ordering codes.



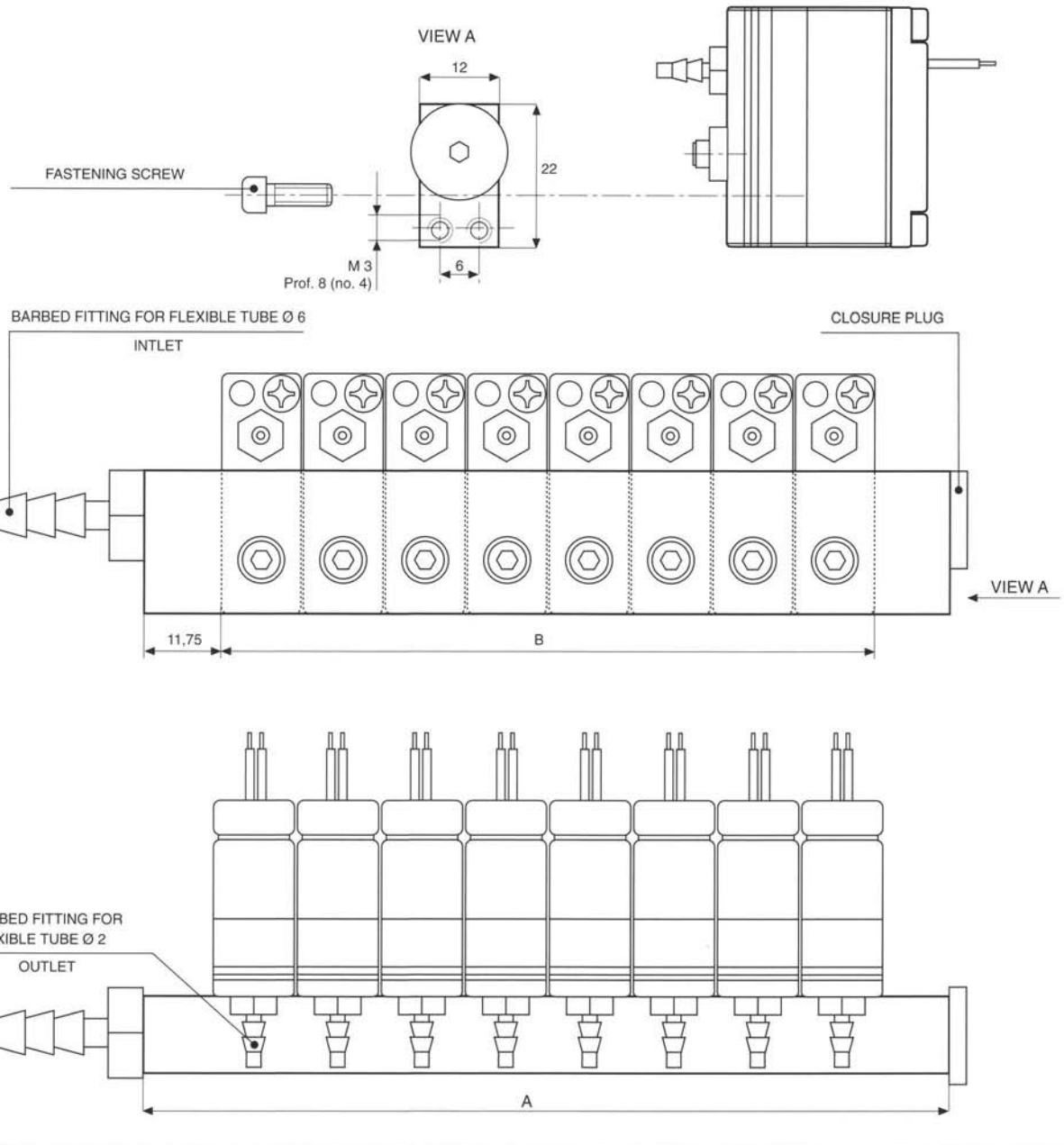
Manifold - 630 Series

Manifolds for multiple installing represent a fast and safe system of fastening and connection for all 630 Series models.
Manifolds, in nickel-plated brass, is available in a single pattern able to contain up to 8 solenoid valves.
It comes in kit with fastening screws, inlet push-in fittings and closure plugs.

How to order manifolds

Pattern	Kit code	A (mm)	B (mm)
no. 8 Solenoid valves	831.100 K	123	99.5

8 position manifold - Assembly scheme



Tension Reducer (PRB) for 8-control Solenoid Valves - 758 Series

PRB (Power Reduction Board) scheme, expressly developed for 758 Series, 8 control models, allows a significated reduction of the solenoid valve power consumption and optimises its use temperature even in particularly difficult use conditions, such as:

- use with non-stabilized tensions
- use in high temperature environments
- continuative use with 100%-duty-cycle

PRB circuit is totally transparent to control driver of the valve and it intervenes in the case in which control times exceed 100 ms, by providing the coil with a resistance in series with consequent reduction of feeding tension. Considering the low value of the required tension to keep the valve open, the dissipation on the resistance results extremely reduced.

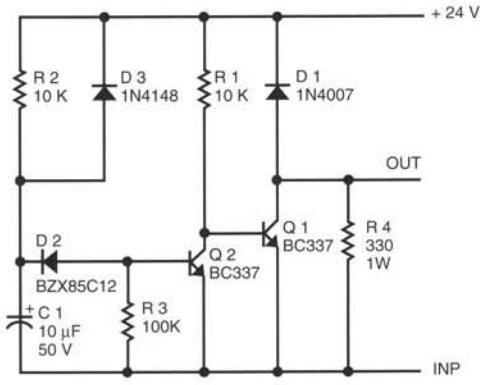
Marginal note

1. PRB circuit limits solenoid valves maximum operative frequency to 20 Hz.
2. PRB circuit is not consistent with solenoid valves equipped with anti-disturbance diodes.

PRB circuit incidence on the power dissipated by solenoid valves

Model		VDC	Dissipated power (single coil)	
Solenoid Valves	□□□7588□□□□24	24	without PRB	1.25 W
Solenoid Valves	□□□7588□□□□24	24	with PRB	0.42 W
Solenoid Valves	□□□7588□□□□JJ	24	without PRB	1.9 W
Solenoid Valves	□□□7588□□□□JJ	24	with PRB	0.65 W

PRB Circuit, electric scheme



How to order PRB driver board - Available

The PRB driver boards are suitable for all models of 8-control, 24 VDC version 758 Series.

Model		VDC	No. Channels	No. connetable Solenoid valves	(PRB) Driver Board Code
Solenoid Valves	□□□7588□□□□24	24	48	6	560.072 G
Solenoid Valves	□□□7588□□□□24	24	40	5	560.107 P
Solenoid Valves	□□□7588□□□□24	24	32	4	560.108 Q
Solenoid Valves	□□□7588□□□□JJ	24	48	6	560.092 A
Solenoid Valves	□□□7588□□□□JJ	24	40	5	560.105 N
Solenoid Valves	□□□7588□□□□JJ	24	32	4	560.106 O

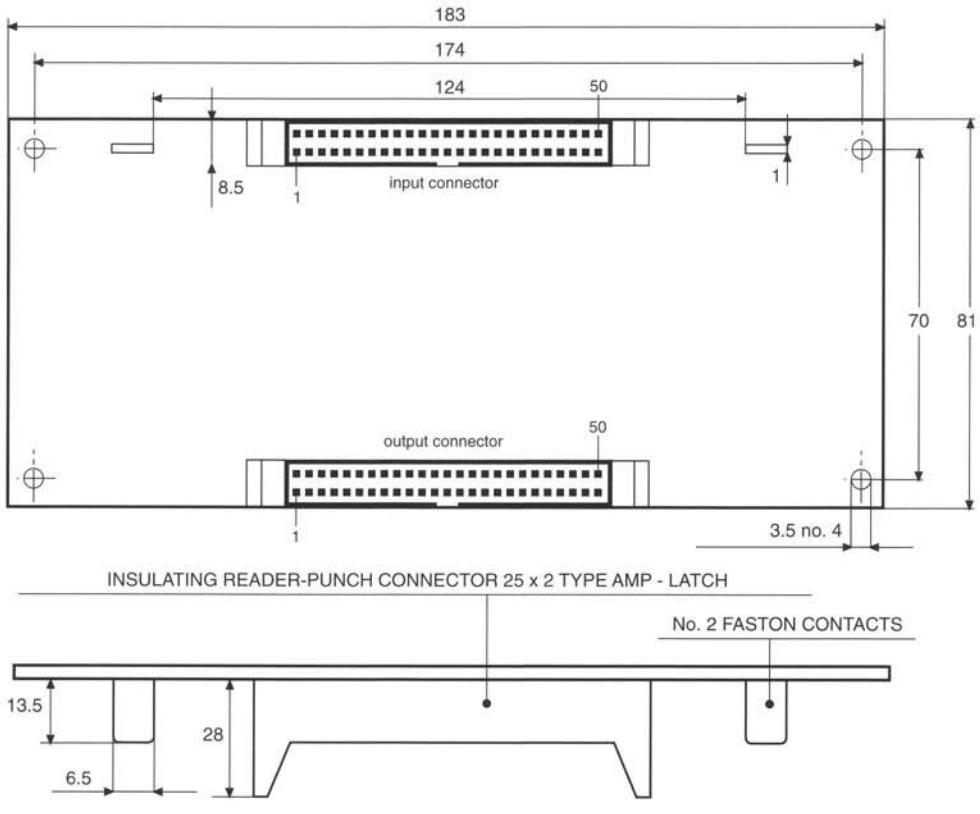
CONNECTOR INPUT 50 PIN

1 • Valve 1	Input 1	26 • Valve 4	Input 2
2 • Valve 1	Input 2	27 • Valve 4	Input 3
3 • Valve 1	Input 3	28 • Valve 4	Input 4
4 • Valve 1	Input 4	29 • Valve 4	Input 5
5 • Valve 1	Input 5	30 • Valve 4	Input 6
6 • Valve 1	Input 6	31 • Valve 4	Input 7
7 • Valve 1	Input 7	32 • Valve 4	Input 8
8 • Valve 1	Input 8	33 • Valve 5	Input 1
9 • Valve 2	Input 1	34 • Valve 5	Input 2
10 • Valve 2	Input 2	35 • Vaive 5	Input 3
11 • Valve 2	Input 3	36 • Valve 5	Input 4
12 • Valve 2	Input 4	37 • Valve 5	Input 5
13 • Valve 2	Input 5	38 • Valve 5	Input 6
14 • Valve 2	Input 6	39 • Valve 5	Input 7
15 • Valve 2	Input 7	40 • Valve 5	Input 8
16 • Valve 2	Input 8	41 • Valve 6	Input 1
17 • Valve 3	Input 1	42 • Valve 6	Input 2
18 • Valve 3	Input 2	43 • Valve 6	Input 3
19 • Valve 3	Input 3	44 • Valve 6	Input 4
20 • Valve 3	Input 4	45 • Valve 6	Input 5
21 • Valve 3	Input 5	46 • Valve 6	Input 6
22 • Valve 3	Input 6	47 • Valve 6	Input 7
23 • Valve 3	Input 7	48 • Valve 6	Input 8
24 • Valve 3	Input 8	49 • —	
25 • Valve 4	Input 1	50 • —	

CONNECTOR OUTPUT 50 PIN

1 • Valve 1	Output Control 1	26 • Valve 4	Output Control 2
2 • Valve 1	Output Control 2	27 • Valve 4	Output Control 3
3 • Valve 1	Output Control 3	28 • Valve 4	Output Control 4
4 • Valve 1	Output Control 4	29 • Valve 4	Output Control 5
5 • Valve 1	Output Control 5	30 • Valve 4	Output Control 6
6 • Valve 1	Output Control 6	31 • Valve 4	Output Control 7
7 • Valve 1	Output Control 7	32 • Valve 4	Output Control 8
8 • Valve 1	Output Control 8	33 • Valve 5	Output Control 1
9 • Valve 2	Output Control 1	34 • Valve 5	Output Control 2
10 • Valve 2	Output Control 2	35 • Valve 5	Output Control 3
11 • Valve 2	Output Control 3	36 • Valve 5	Output Control 4
12 • Valve 2	Output Control 4	37 • Valve 5	Output Control 5
13 • Valve 2	Output Control 5	38 • Valve 5	Output Control 6
14 • Valve 2	Output Control 6	39 • Valve 5	Output Control 7
15 • Valve 2	Output Control 7	40 • Valve 5	Output Control 8
16 • Valve 2	Output Control 8	41 • Valve 6	Output Control 1
17 • Valve 3	Output Control 1	42 • Valve 6	Output Control 2
18 • Valve 3	Output Control 2	43 • Valve 6	Output Control 3
19 • Valve 3	Output Control 3	44 • Valve 6	Output Control 4
20 • Valve 3	Output Control 4	45 • Valve 6	Output Control 5
21 • Valve 3	Output Control 5	46 • Valve 6	Output Control 6
22 • Valve 3	Output Control 6	47 • Valve 6	Output Control 7
23 • Valve 3	Output Control 7	48 • Valve 6	Output Control 8
24 • Valve 3	Output Control 8	49 • —	
25 • Valve 4	Output Control 1	50 • —	

PRB Scheme, Size and Connections



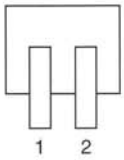
Electrical characteristics

Nominal control tension	24 VDC	Maximum frequency use	20 Hz
Minimun control tension	21.6 VDC	Shutdown diode	Included
Attivation time of riductor	2 sec.		

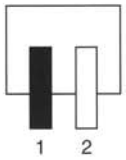
9-Channel Driver Board PCM 8130

The 9-channel driver board PCM 8130 is prearranged for the control of the proportional flow solenoid valves of 860 PCM Series. Said driver board my be setup through two dip-switches both for the control of 6- bit models with 64 conductance levels, and for the control of 8-bit models with 256 conductance levels.
The driver board accepts either 6- and 8-digital signals with direct input, or 0-10 V tension signals, subsequently converted into binary code. Said drive board may be integrated in a suitable protection box , which makes easier its installation (see 9-channel Driver Box PCM).

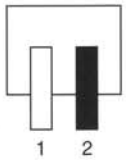
DIP - SWITCH SETTING



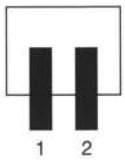
6 bit resolution
Solenoid valve control through digital input (channels)



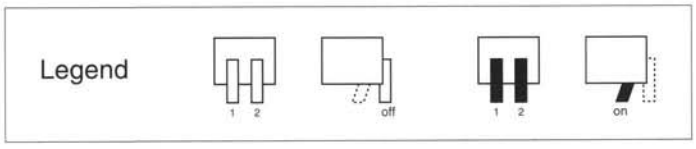
8 bit resolution
Solenoid valve control through digital input (channels)



6 bit resolution
Solenoid valve control through analogic input (0+10 V)



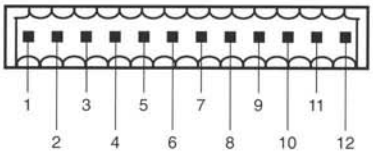
8 bit resolution
Solenoid valve control through analogic input (0+10 V)



Electrical characteristics	
Supply voltage	24 VDC ± 10 %
Absorbtion current	20 mA (when all s.v. closed)
Input tension for s.v. control (single channel)	5 ÷ 32 VCD
Input current for s.v. control (single channel)	3 ÷ 25 mA

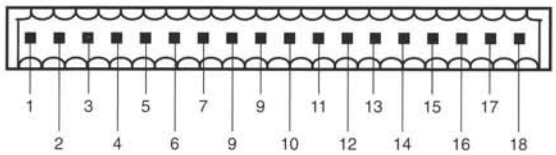
9-Channel Driver Board PCM 8130

12-POLE TERMINAL BLOCK CONNECTOR

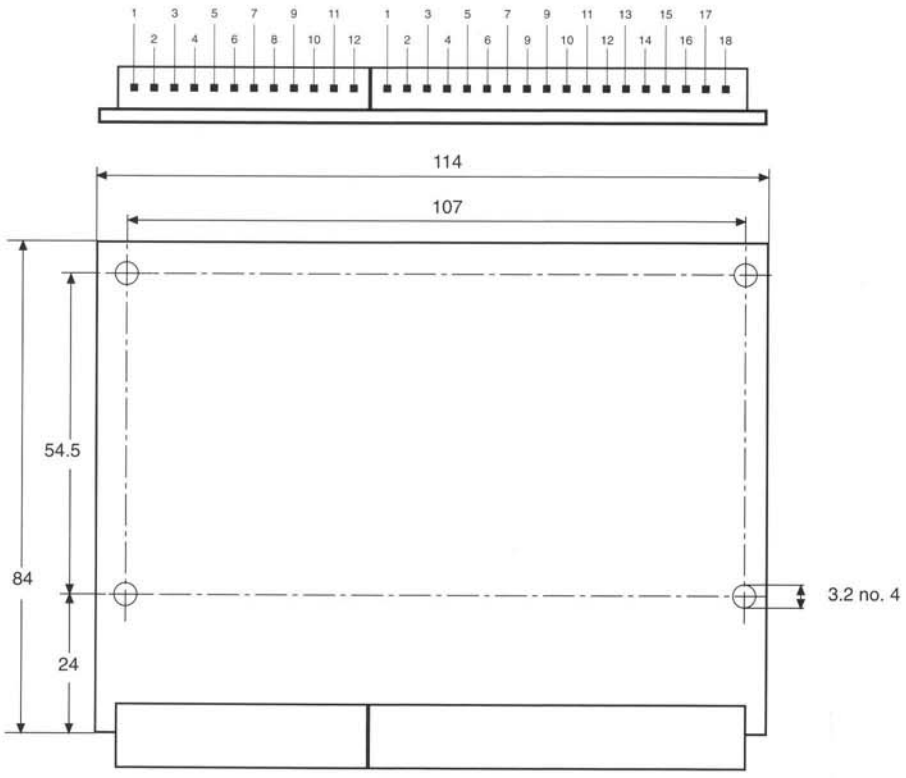


1 • Valve 9 Output control	
2 • Valve 8 Output control	
3 • Valve 7 Output control	
4 • Valve 6 Output control	
5 • Valve 5 Output control	
6 • Valve 4 Output control	
7 • Valve 3 Output control	
8 • Valve 2 Output control	
9 • Valve 1 Output control	
10 • Valve Common	
11 • Valve Common	
12 • Valve Common	

18-POLE TERMINAL BLOCK CONNECTOR



1 • + Supply	15 • —
2 • – Supply	16 • —
3 • + Channel 1 Input	17 • —
4 • + Channel 2 Input	18 • —
5 • + Channel 3 Input	
6 • + Channel 4 Input	
7 • + Channel 5 Input	
8 • + Channel 6 Input	
9 • + Channel 7 Input	
10 • + Channel 8 Input	
11 • – Channels Input	
12 • Output 10 VDC	
13 • Input control in tension 0 ÷ 10 VDC	
14 • —	



8-Channel Universal Driver Board

The 8-channel universal driver board is suitable for the pilot driving of a wide range of Matrix solenoid valves both in on-off modality, and in speed-up modality

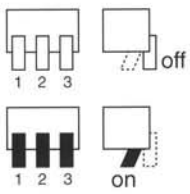
In on-off modality the driver board automatically provides to reduce the tension value after the SV opening phase, reducing in such a way its consumption and thermal dissipation.
In speed-up modality the care and precision of the electric control assure the best working conditions to the Solenoid valve and optimize its performance.

The arrangement of the driver board to the different SV features (configuration change) is easily performed by the user through the setup of three dip-switches, which are present therein.

The universal driver board is available with some different connection typologies. D-Sub and terminal board types may be integrated in a suitable protection box, facilitating their installation (see 8-Channel Universal Driver Box).

SETTING DIP - SWITCH

Solenoid Valve / Series	DIP - SWITCH
8 2 0 XX	
8 2 0 KK	
(1) 8 5 0 9 XX	
(1) 8 5 0 9 KK	
7 5 0 8 XX	
7 5 0 8 KK	
7 2 0 24	
7 5 0 8 24	
8 2 0 24	
(1) 8 5 0 9 24	

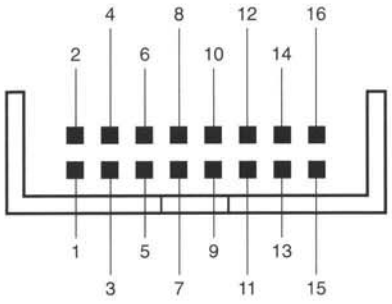


(1) - Only 8 channels connectable (no connection for the ninth channel)

Electrical characteristics	
Supply voltage	24 VDC ± 10%
Absorbtion current	20 mA (when all s.v. closed)
Maximum frequency piloting	200 Hz
Input tension for s.v. control (single channel)	5 ÷ 32 VCD
Input current for s.v. control (single channel)	3 ÷ 25 mA
Control	NPN or PNP type

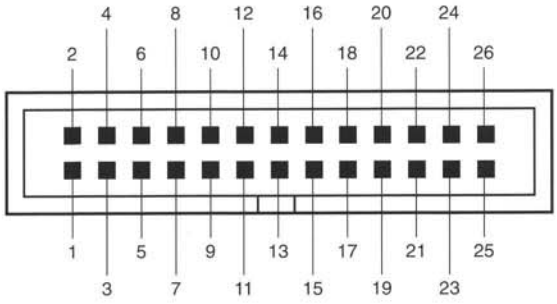
8-Channel Universal Driver Board UDB 8010

AMP MODU II CONNECTOR

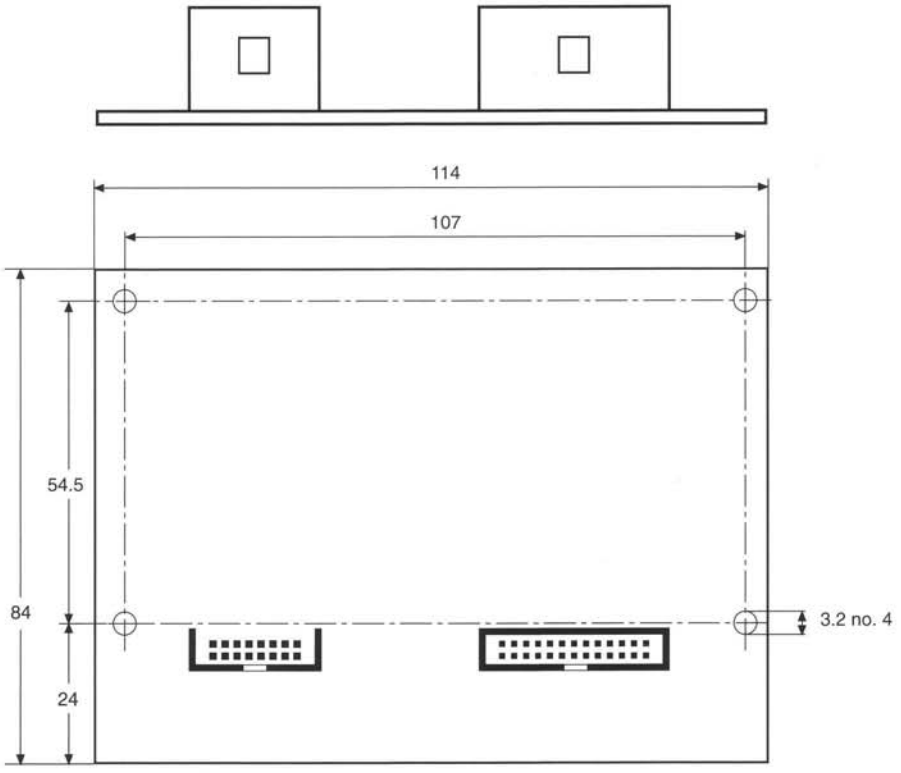


1 • Valve 8 Output control	
2 • Valve 7 Output control	
3 • Valve 6 Output control	
4 • Valve 5 Output control	
5 • Valve 4 Output control	
6 • Valve 3 Output control	
7 • Valve 2 Output control	
8 • Valve 1 Output control	
9 • Valve Common	
10 • Valve Common	
11 • Valve Common	
12 • Valve Common	
13 • —	
14 • —	
15 • —	
16 • —	

AMP LATCH 13 x 2 CONNECTOR

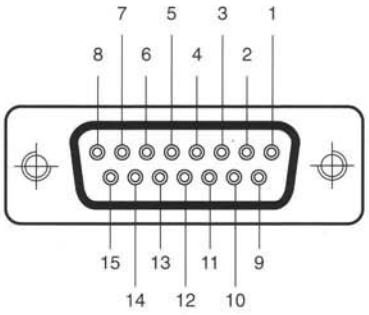


1 • + Supply	17 • – Channel 4 Input
2 • + Supply	18 • + Channel 4 Input
3 • – Supply	19 • – Channel 5 Input
4 • – Supply	20 • + Channel 5 Input
5 • – Supply	21 • – Channel 6 Input
6 • – Supply	22 • + Channel 6 Input
7 • – Supply	23 • – Channel 7 Input
8 • – Supply	24 • + Channel 7 Input
9 • – Supply	25 • – Channel 8 Input
10 • – Supply	26 • + Channel 8 Input
11 • – Channel 1 Input	
12 • + Channel 1 Input	
13 • – Channel 2 Input	
14 • + Channel 2 Input	
15 • – Channel 3 Input	
16 • + Channel 3 Input	



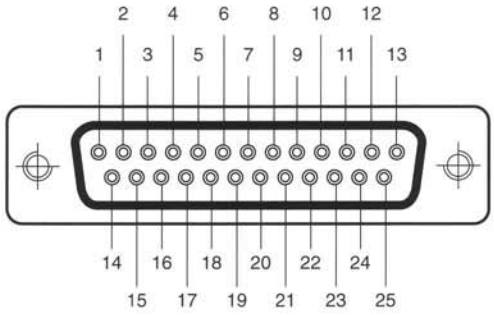
8-Channel Universal Driver Board UDB 8020

15-POSITION D-SUB CONNECTOR

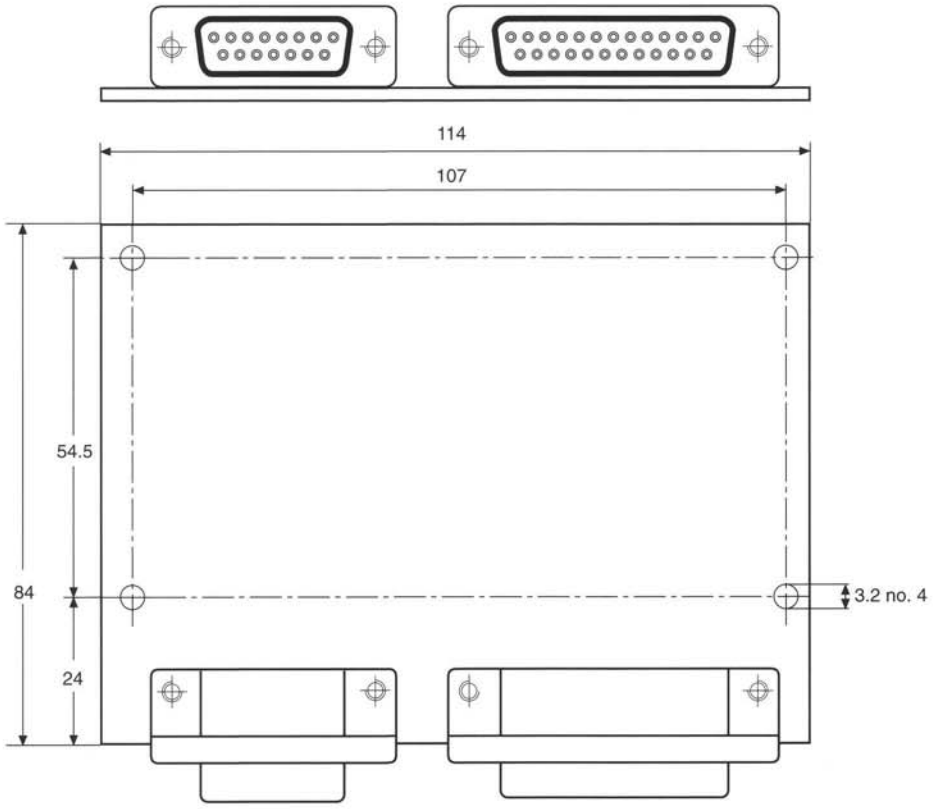


1 • Valve 1 Output control	
2 • Valve 2 Output control	
3 • Valve 3 Output control	
4 • Valve 4 Output control	
5 • Valve 5 Output control	
6 • Valve 6 Output control	
7 • Valve 7 Output control	
8 • Valve 8 Output control	
9 • Valve Common	
10 • Valve Common	
11 • Valve Common	
12 • Valve Common	
13 • —	
14 • —	
15 • —	

25-POSITION D-SUB CONNECTOR

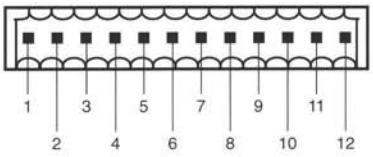


1 • + Supply	17 • – Supply
2 • + Supply	18 • – Channel 1 Input
3 • – Supply	19 • – Channel 2 Input
4 • – Supply	20 • – Channel 3 Input
5 • + Channel 1 Input	21 • – Channel 4 Input
6 • + Channel 2 Input	22 • – Channel 5 Input
7 • + Channel 3 Input	23 • – Channel 6 Input
8 • + Channel 4 Input	24 • – Channel 7 Input
9 • + Channel 5 Input	25 • – Channel 8 Input
10 • + Channel 6 Input	
11 • + Channel 7 Input	
12 • + Channel 8 Input	
13 • —	
14 • + Supply	
15 • + Supply	
16 • – Supply	



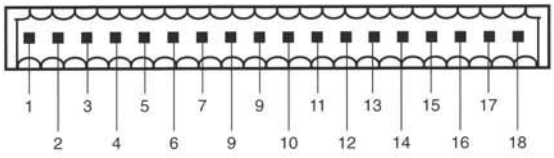
8-Channel Universal Driver Board UDB 8030

12-POLE TERMINAL BLOCK CONNECTOR

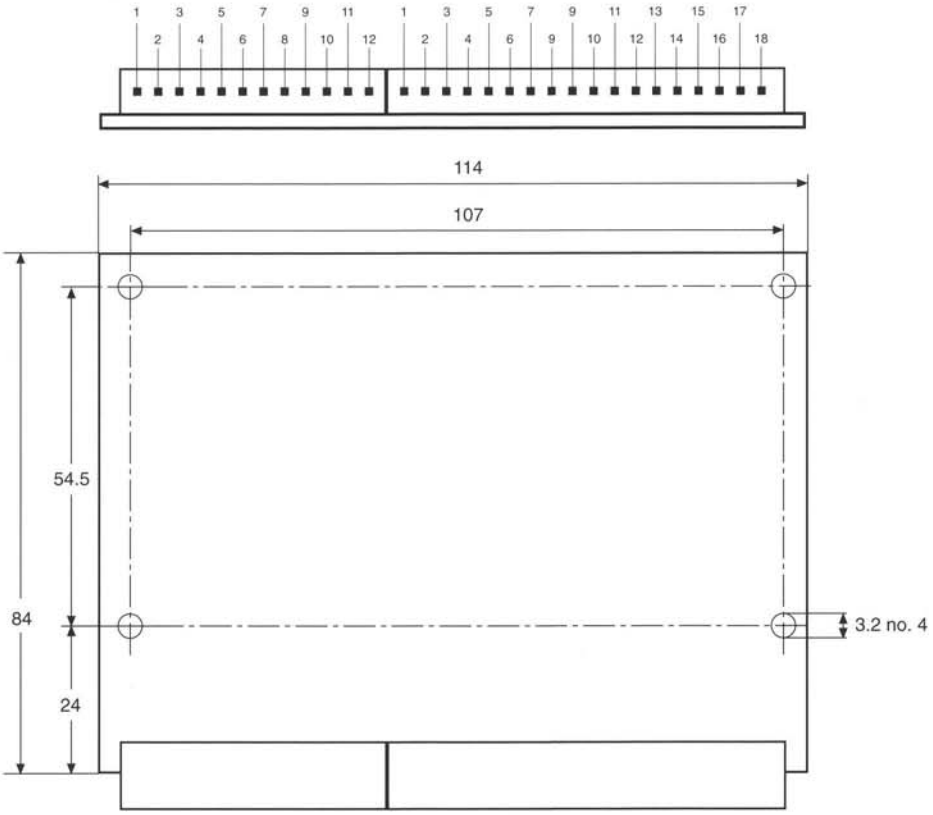


1 • Valve 8 Output control
2 • Valve 7 Output control
3 • Valve 6 Output control
4 • Valve 5 Output control
5 • Valve 4 Output control
6 • Valve 3 Output control
7 • Valve 2 Output control
8 • Valve 1 Output control
9 • Valve Common
10 • Valve Common
11 • Valve Common
12 • Valve Common

18-POLE TERMINAL BLOCK CONNECTOR

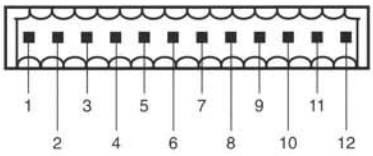


1 • + Supply	15 • + Channel 7 Input
2 • – Supply	16 • – Channel 7 Input
3 • + Channel 1 Input	17 • + Channel 8 Input
4 • – Channel 1 Input	18 • – Channel 8 Input
5 • + Channel 2 Input	
6 • – Channel 2 Input	
7 • + Channel 3 Input	
8 • – Channel 3 Input	
9 • + Channel 4 Input	
10 • – Channel 4 Input	
11 • + Channel 5 Input	
12 • – Channel 5 Input	
13 • + Channel 6 Input	
14 • – Channel 6 Input	



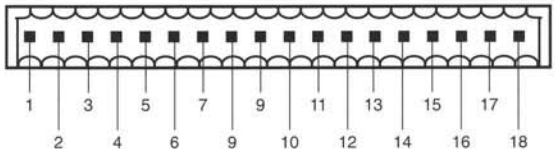
9-Channel Driver Box PCM 8630

12-POLE TERMINAL BLOCK CONNECTOR

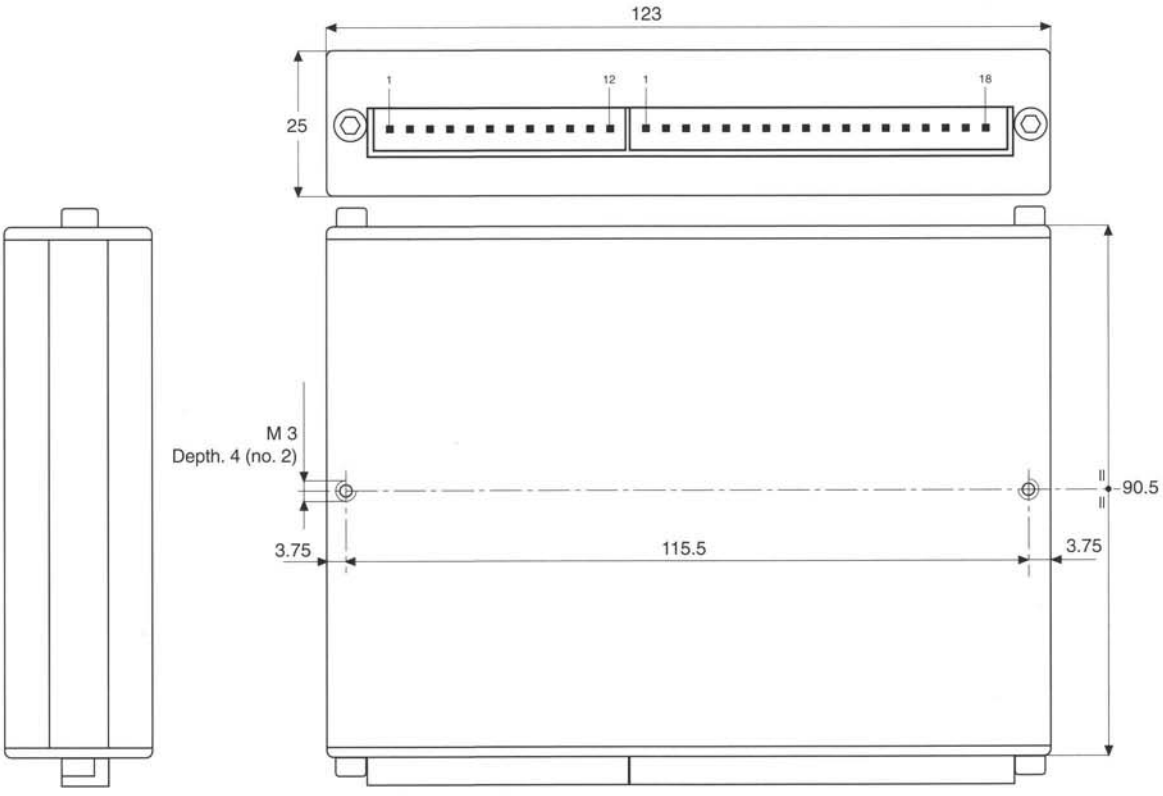


1 • Valve 9 Output control	
2 • Valve 8 Output control	
3 • Valve 7 Output control	
4 • Valve 6 Output control	
5 • Valve 5 Output control	
6 • Valve 4 Output control	
7 • Valve 3 Output control	
8 • Valve 2 Output control	
9 • Valve 1 Output control	
10 • Valve Common	
11 • Valve Common	
12 • Valve Common	

18-POLE TERMINAL BLOCK CONNECTOR

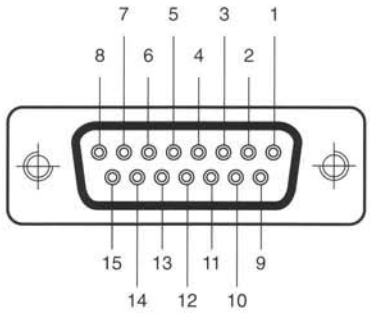


1 • + Supply	15 • —
2 • – Supply	16 • —
3 • + Channel 1 Input	17 • —
4 • + Channel 2 Input	18 • —
5 • + Channel 3 Input	
6 • + Channel 4 Input	
7 • + Channel 5 Input	
8 • + Channel 6 Input	
9 • + Channel 7 Input	
10 • + Channel 8 Input	
11 • – Channels Input	
12 • Outlet 10 VDC	
13 • Input control for tension 0 ÷ 10 VDC	
14 • —	



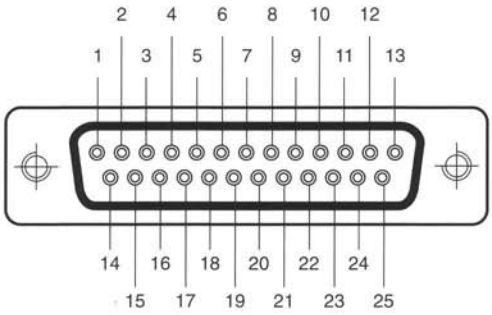
8-Channel Universal Driver Board UDB 8520

15-POSITION D-SUB CONNECTOR

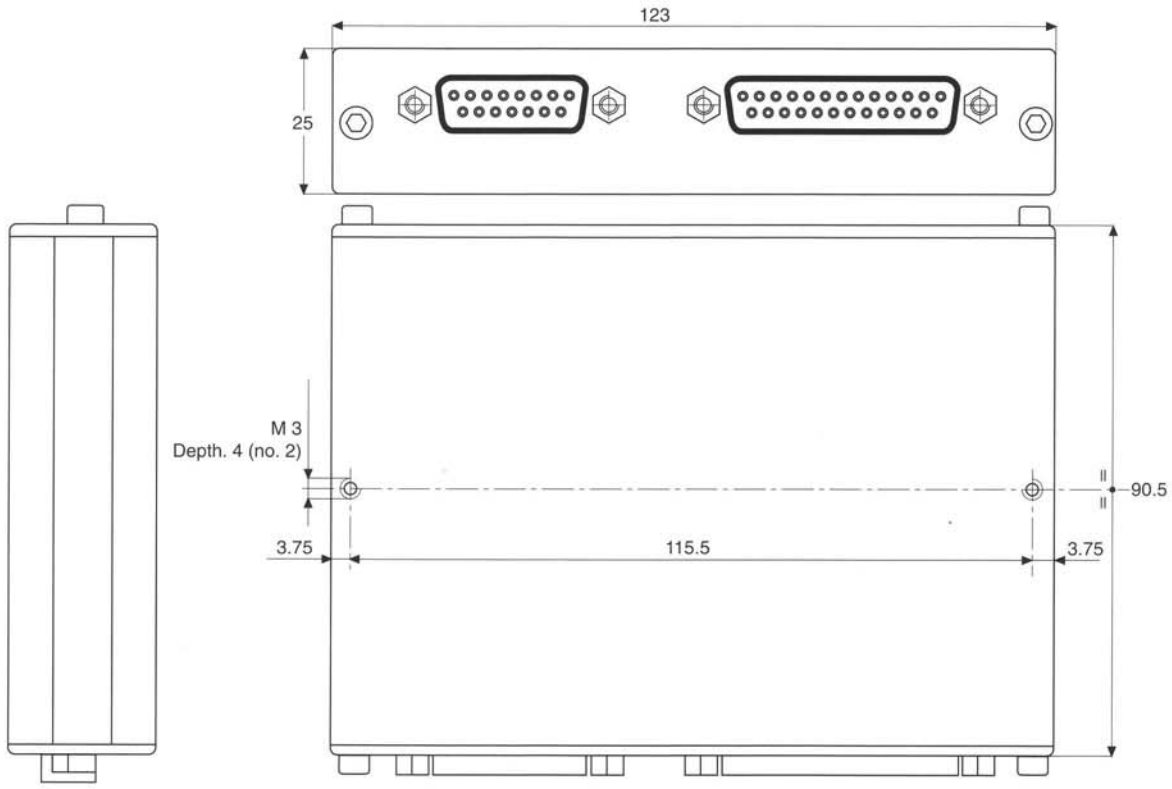


1 • Valve 1 Output control	
2 • Valve 2 Output control	
3 • Valve 3 Output control	
4 • Valve 4 Output control	
5 • Valve 5 Output control	
6 • Valve 6 Output control	
7 • Valve 7 Output control	
8 • Valve 8 Output control	
9 • Valve Common	
10 • Valve Common	
11 • Valve Common	
12 • Valve Common	
13 • —	
14 • —	
15 • —	

25-POSITION D-SUB CONNECTOR



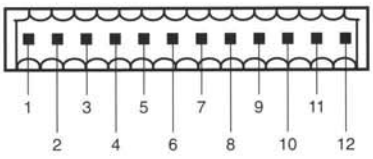
1 • + Supply	17 • – Supply
2 • + Supply	18 • – Channel 1 Input
3 • – Supply	19 • – Channel 2 Input
4 • – Supply	20 • – Channel 3 Input
5 • + Channel 1 Input	21 • – Channel 4 Input
6 • + Channel 2 Input	22 • – Channel 5 Input
7 • + Channel 3 Input	23 • – Channel 6 Input
8 • + Channel 4 Input	24 • – Channel 7 Input
9 • + Channel 5 Input	25 • – Channel 8 Input
10 • + Channel 6 Input	
11 • + Channel 7 Input	
12 • + Channel 8 Input	
13 • —	
14 • + Supply	
15 • + Supply	
16 • – Supply	



ELECTRONIC DRIVER BOARDS

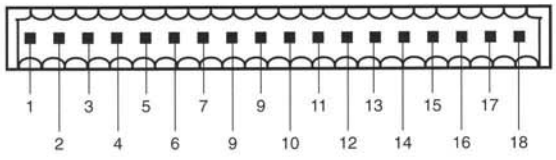
8-Channel Universal Driver Board UDB 8530

12-POLE TERMINAL BLOCK CONNECTOR

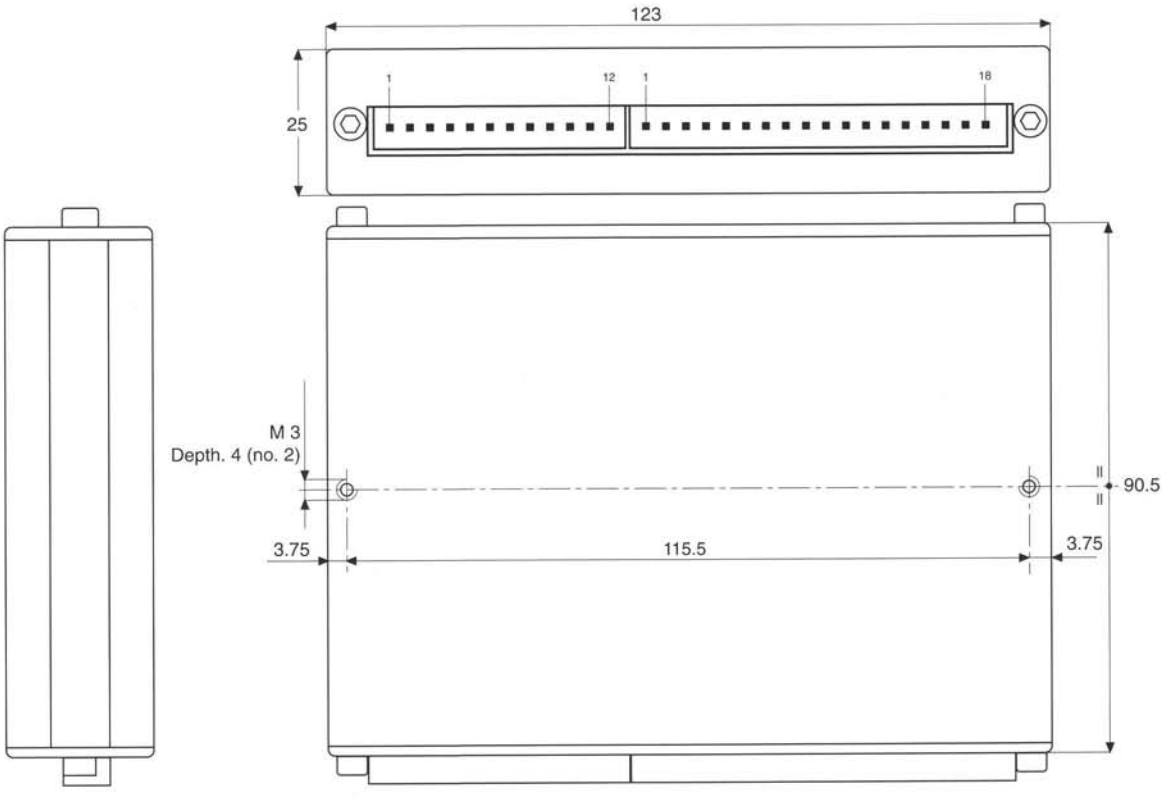


1 • Valve 8 Output control
2 • Valve 7 Output control
3 • Valve 6 Output control
4 • Valve 5 Output control
5 • Valve 4 Output control
6 • Valve 3 Output control
7 • Valve 2 Output control
8 • Valve 1 Output control
9 • Valve Common
10 • Valve Common
11 • Valve Common
12 • Valve Common

18-POLE TERMINAL BLOCK CONNECTOR

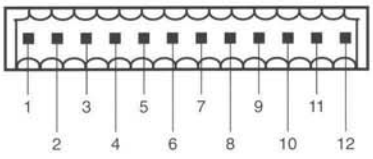


1 • + Supply	15 • + Channel 7 Input
2 • – Supply	16 • – Channel 7 Input
3 • + Channel 1 Input	17 • + Channel 8 Input
4 • – Channel 1 Input	18 • – Channel 8 Input
5 • + Channel 2 Input	
6 • – Channel 2 Input	
7 • + Channel 3 Input	
8 • – Channel 3 Input	
9 • + Channel 4 Input	
10 • – Channel 4 Input	
11 • + Channel 5 Input	
12 • – Channel 5 Input	
13 • + Channel 6 Input	
14 • – Channel 6 Input	



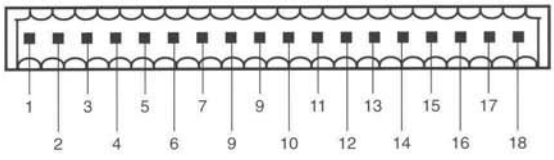
9-Channel Universal Driver Board UDB 9030

12-POLE TERMINAL BLOCK CONNECTOR

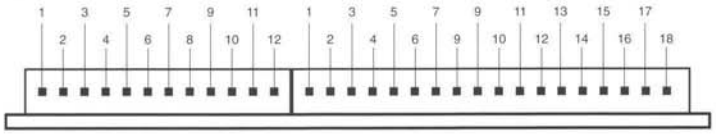


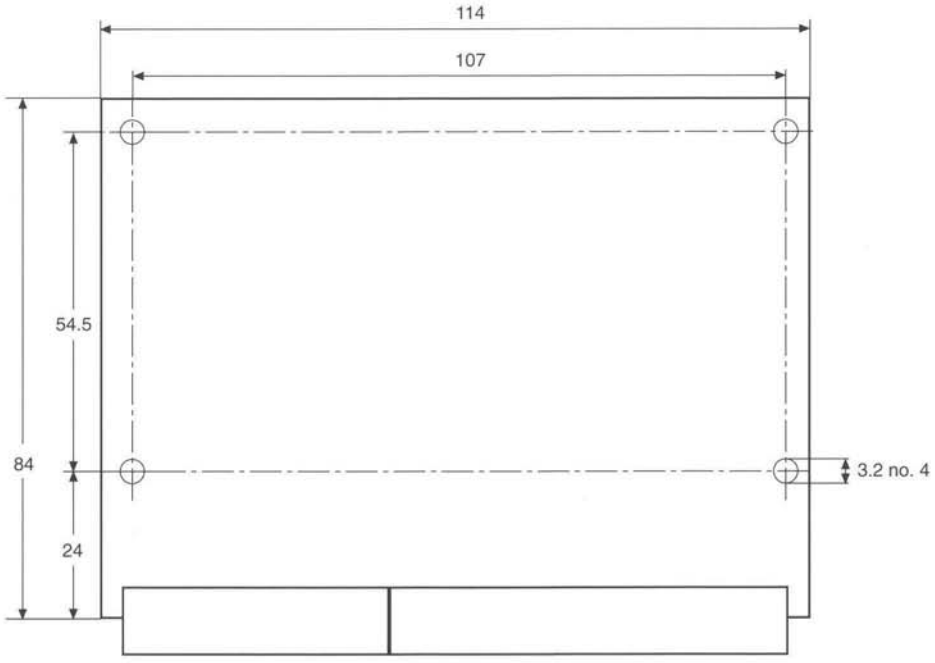
1 • Valve **9** Output control	
2 • Valve 8 Output control	
3 • Valve 7 Output control	
4 • Valve 6 Output control	
5 • Valve 5 Output control	
6 • Valve 4 Output control	
7 • Valve 3 Output control	
8 • Valve 2 Output control	
9 • Valve 1 Output control	
10 • Valve Common	
11 • Valve Common	
12 • Valve Common	

18-POLE TERMINAL BLOCK CONNECTOR



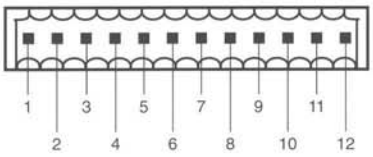
1 • + Supply	15 •
2 • – Supply	16 •
3 • + Channel 1 Input	17 •
4 • + Channel 2 Input	18 •
5 • + Channel 3 Input	
6 • + Channel 4 Input	
7 • + Channel 5 Input	
8 • + Channel 6 Input	
9 • + Channel 7 Input	
10 • + Channel 8 Input	
11 • + Channel **9** Input	
12 • – Channel **x** Input	
13 • —	
14 •	





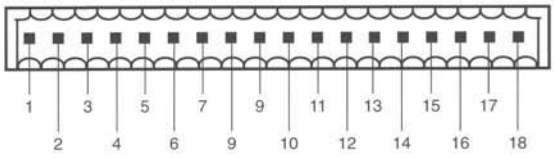
9-Channel Universal Driver Board UDB 9530

12-POLE TERMINAL BLOCK CONNECTOR



1 • Valve **9** Output control	
2 • Valve 8 Output control	
3 • Valve 7 Output control	
4 • Valve 6 Output control	
5 • Valve 5 Output control	
6 • Valve 4 Output control	
7 • Valve 3 Output control	
8 • Valve 2 Output control	
9 • Valve 1 Output control	
10 • Valve Common	
11 • Valve Common	
12 • Valve Common	

18-POLE TERMINAL BLOCK CONNECTOR



1 • + Supply	15 •
2 • – Supply	16 •
3 • + Channel 1 Input	17 •
4 • + Channel 2 Input	18 •
5 • + Channel 3 Input	
6 • + Channel 4 Input	
7 • + Channel 5 Input	
8 • + Channel 6 Input	
9 • + Channel 7 Input	
10 • + Channel 8 Input	
11 • + Channel **9** Input	
12 • – Channel **x** Input	
13 • —	
14 •