860 Series

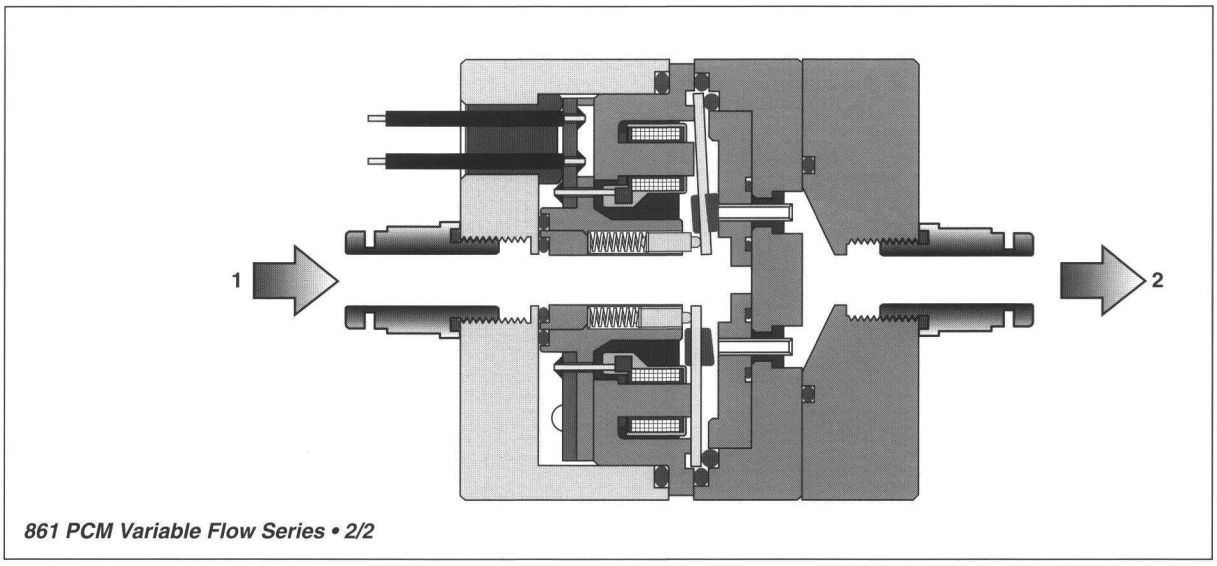
Proportional solenoid multi-valve | 2/2 NC

PNEUMATIC DIVISION

MATRIX
mechatronics

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 N*l* / (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 N*l* / (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	N*l* / (min x bar)
Minimum flow	1.69	N*l* / (min x bar)
Flow rate, maximum 6 bar	752.84	N*l* / min

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

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

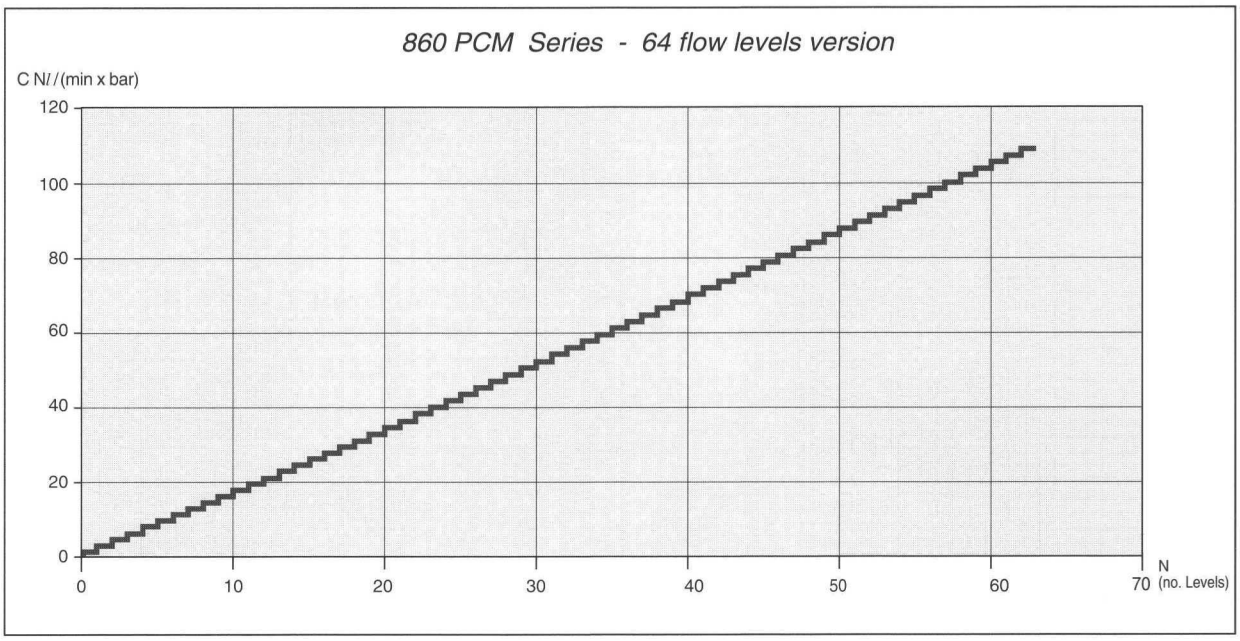
The lowest value of flow is determined by opening either the channel 6 (6-bit pattern) or the channel 8 (8-bit pattern). It represents the highest definition level of the solenoid valve.

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

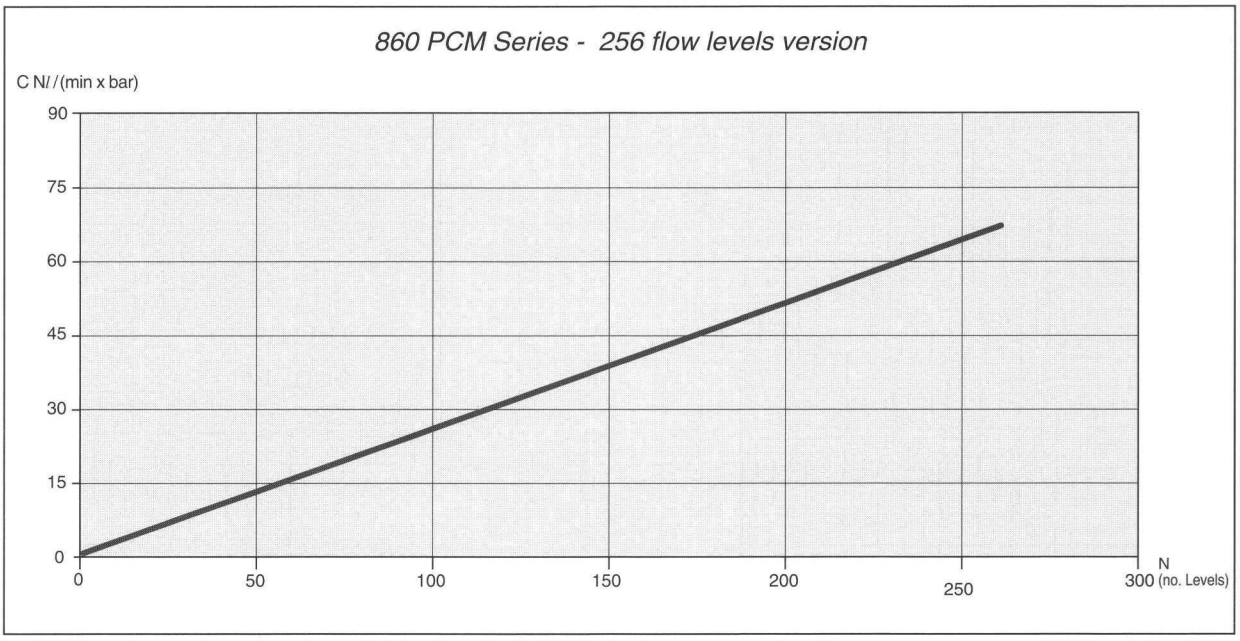
The total flow value is determined by the pattern (6-bit or 8-bit binary code), assumed by the channels, where 0-value represents the corresponding electrical OFF, and 1-value represents the corresponding electrical ON.

860 PCM Series - 64 flow levels version								
Level N	Channel pattern						Flow rate 6 bar N*l* / min	C N*l* / (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).

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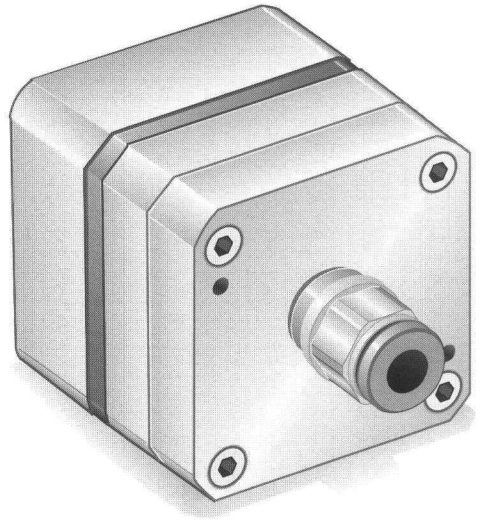
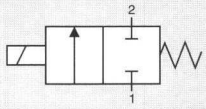


CONTROL:	PCM

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

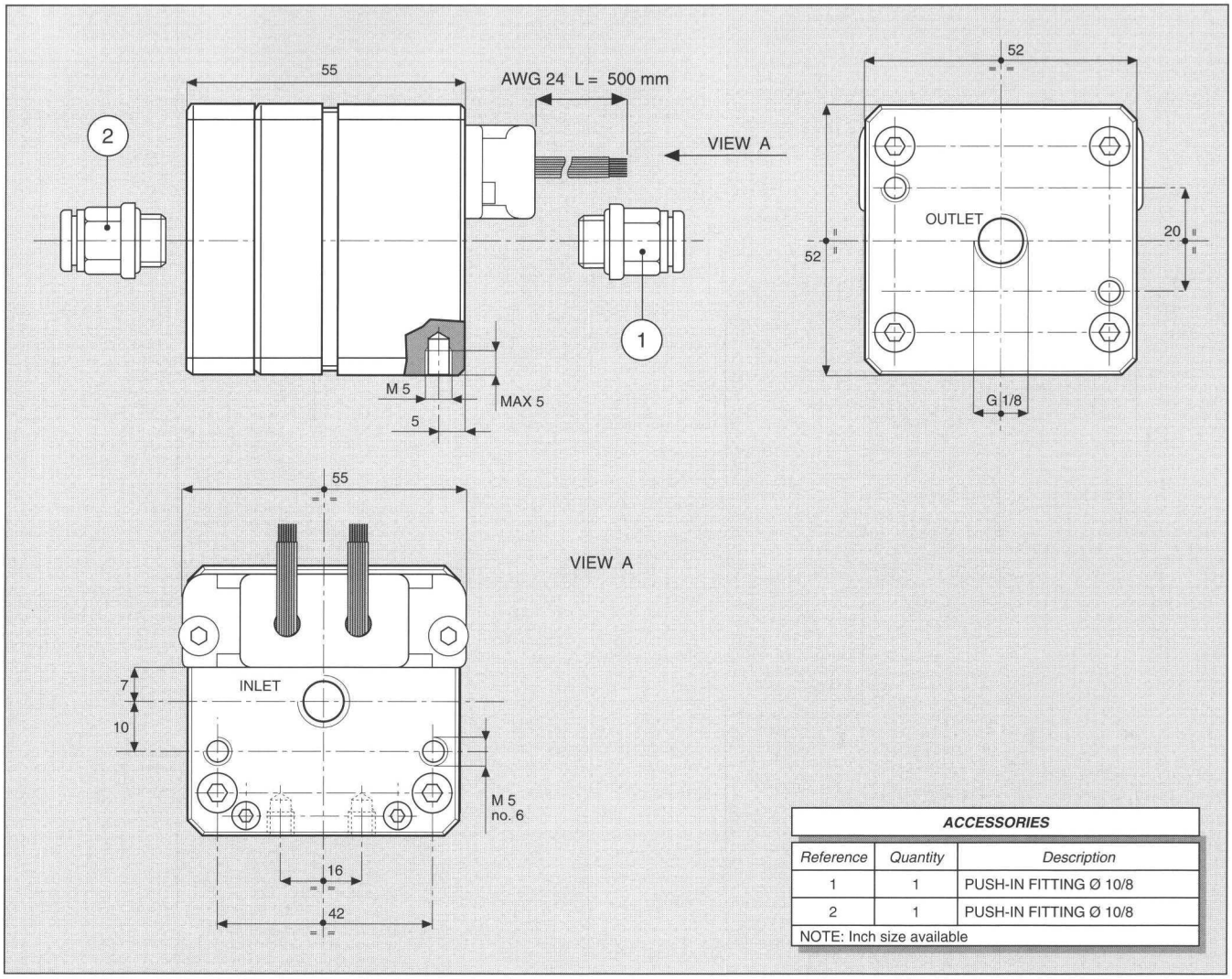
KK	Speed-up in tension	0.8 W

PORT CONNECTION

E	Presetting for Easy connection IP 52 - IP 65

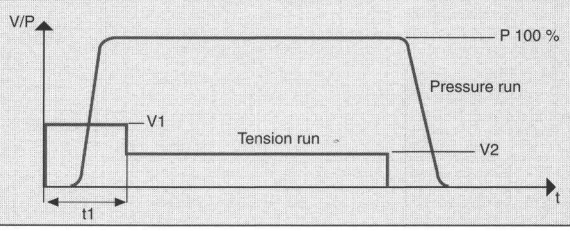
OPERATING PRESSURE

	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