

## MAC

### 400 Series

5-way remote & solenoid pilot operated (5-way pilot)

<b>Available configurations:</b>	Individual inline, individual base mounted or manifold mounted bodies
<b>Port sizes:</b>	1/8", 1/4" ports
<b>Flow:</b>	Up to 1000 NI/min (1.0 Cv)
<b>Pressure range:</b>	Vacuum to 8 bar
<b>Function:</b>	5/2 (single & double operator), 5/3 (closed centre, open centre & pressure centre)
<b>Operation:</b>	Electrical / Remote air
<b>Pilot valve:</b>	DM / DP / DU / GM
<b>Accessories:</b>	Circuit bar / Shut-off valve / Flow controls



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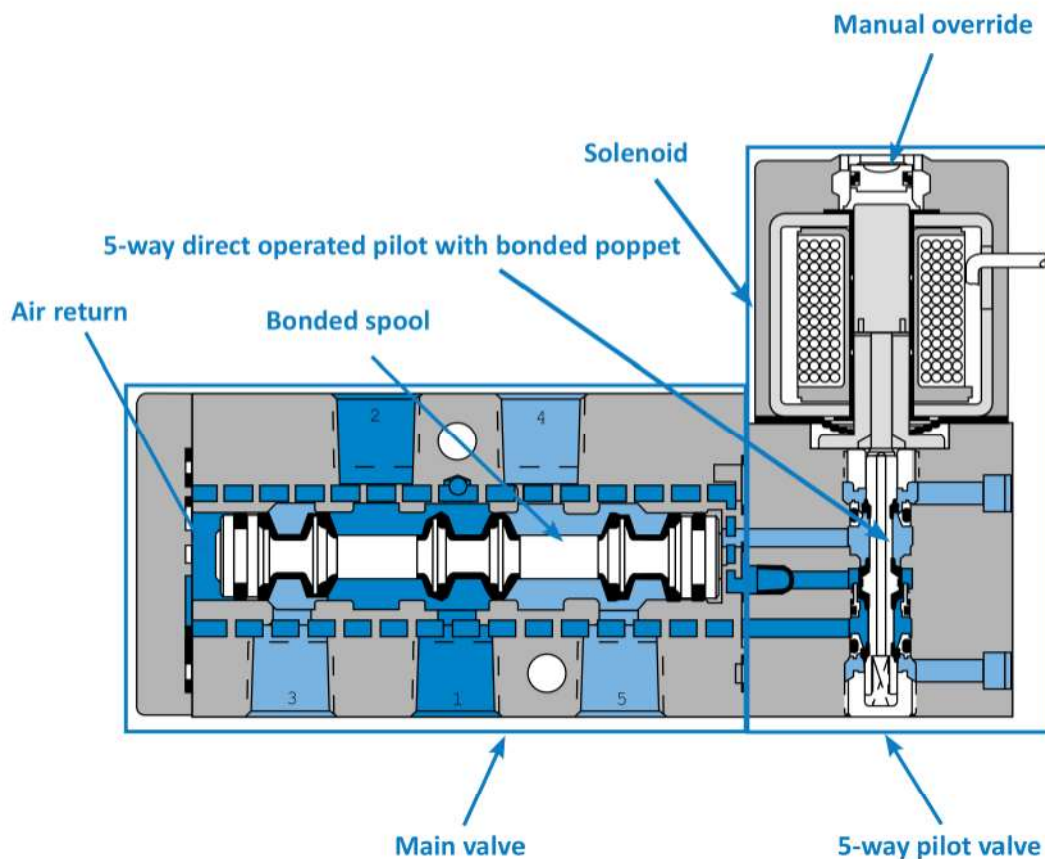
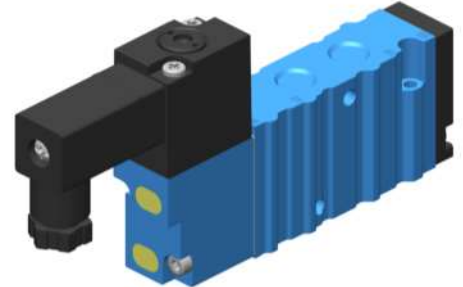


## MAC 400 Series - Solenoid pilot operated valves

5-way, 2 and 3 position, spool

Flow up to 1000 NI/min (1.0 Cv)

- ◇ MAC unique patented 5-way direct operating pilot valve
- ◇ The 5-way pilot develops maximum shifting forces both ways
- ◇ Short stroke with high flow
- ◇ Balanced spool, immune to variations of pressure, also provides high flow
- ◇ Bonded spool with minimum friction, shifting in a glass-like finished bore
- ◇ Wiping effect eliminates sticking
- ◇ Long service life
- ◇ Repair kit available for the complete valve



Valve with side ports, single operator, single pressure, internal pilot

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## Technical Data

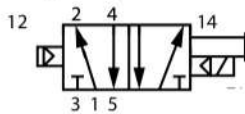
<b>Fluid:</b>	Compressed air, vacuum, inert gases
<b>Pressure range:</b>	Internal pilot - 2 position: 1.3 to 8 bar 3 position: 2.3 to 8 bar External pilot: vacuum to 8 bar
<b>Pilot pressure:</b>	2 position: 1.3 to 8 bar 3 position: 2.3 to 8 bar
<b>Lubrication:</b>	Not required, if used, select a medium aniline point lubricant (between 80°C and 100°C)
<b>Filtration:</b>	40 μ
<b>Temperature range:</b>	-18°C to +50°C
<b>Orifice:</b>	6.2 mm
<b>Flow (at 6 bar, ΔP=1 bar):</b>	1000 NI/min (1.0 Cv)
<b>Coil:</b>	Epoxy encapsulated - Class A wires - 100% ED (mod 0449)
<b>Voltage range:</b>	-15% to +10% of nominal voltage
<b>Protection:</b>	IP54 (GM pilot) - IP65 (DM pilot) (Electrical connection)
<b>Power:</b>	~ Inrush: 10.9 VA Holding: 7.7 VA = 1.8 to 12.7 W
<b>Response times:</b>	24V~/5.4W Energize: 7.3 ms De-energize: 5.3 ms 110V~/50Hz Energize: 8-12 ms De-energize: 7-11 ms

## Solenoid pilot operated valve

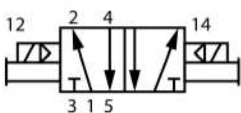
### Single pressure models

5/2

Single operator

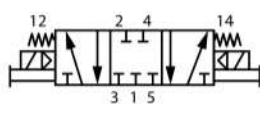


Double operator

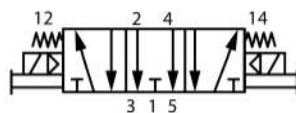


5/3

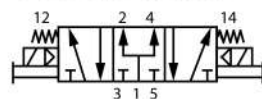
Closed centre



Open centre



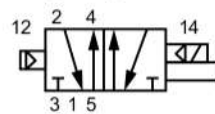
Pressure centre



### Dual pressure models

5/2

Single operator

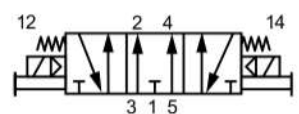


Double operator



5/3

Pressure centre

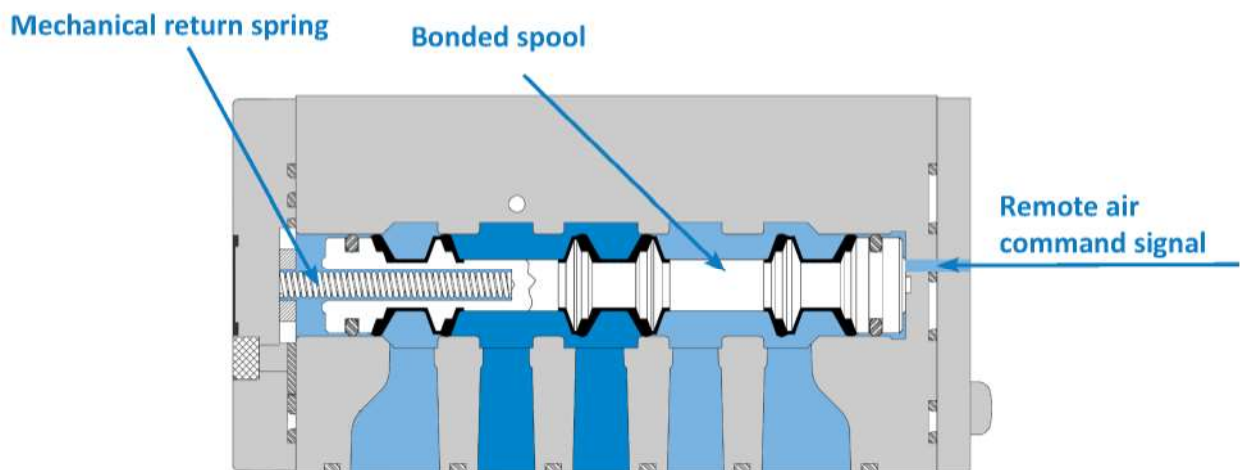
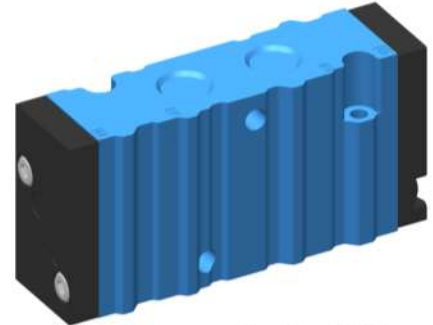


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## MAC 400 Series - Remote air valves

5-way, 2 and 3 position, spool  
 Flow up to 1000 NI/min (1.0 Cv)

- ◇ Balanced spool, immune to variations of pressure, also provides high flow
- ◇ Bonded spool with minimum friction, shifting in a glass-like finished bore
- ◇ Short stroke with high flow
- ◇ Wiping effect eliminates sticking
- ◇ Long service life
- ◇ Repair kit available for the complete valve



**Valve with single remote operator, single pressure, 2 position, manifold**

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## Technical Data

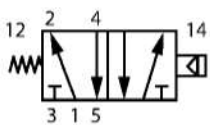
<b>Fluid:</b>	Compressed air, vacuum, inert gases
<b>Pressure range:</b>	Single op.: vacuum to 6.7 bar - Double op.: vacuum to 10 bar
<b>Air signal pressure:</b>	Single op.: 2.7 to 10 bar Double op.: 2 pos.: 1.3 to 10 bar, 3 pos.: 2.3 to 10 bar
<b>Lubrication:</b>	Not required, if used, select a medium aniline point lubricant (between 80°C and 100°C)
<b>Filtration:</b>	40 µ
<b>Temperature range:</b>	-18°C to +50°C
<b>Orifice:</b>	6.2 mm
<b>Flow (at 6 bar, ΔP=1 bar):</b>	1000 NI/min (Cv 1.0)

## Remote air valve

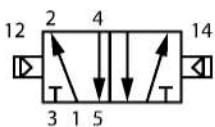
### Single pressure models

5/2

Single operator

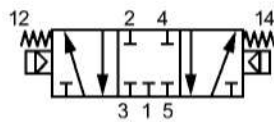


Double operator

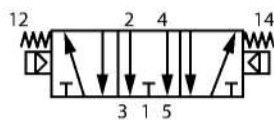


5/3

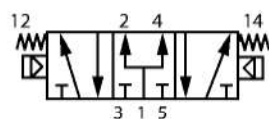
Closed centre



Open centre



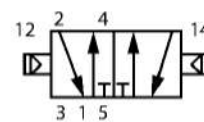
Pressure centre



### Dual pressure models

5/2

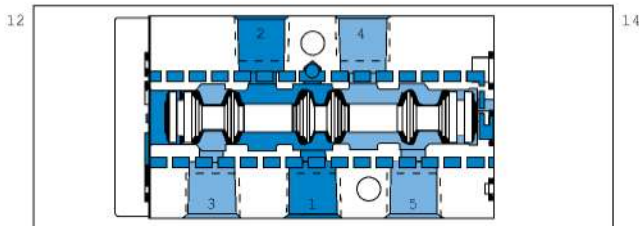
Double operator



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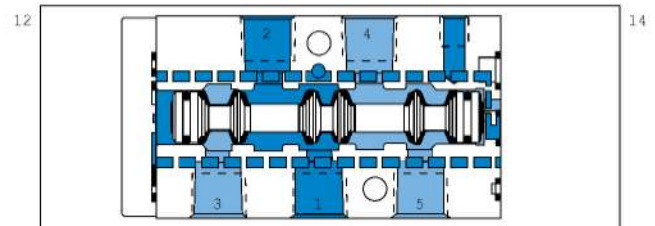
## MAC 400 Series - Spool configurations

**Internal Pilot**



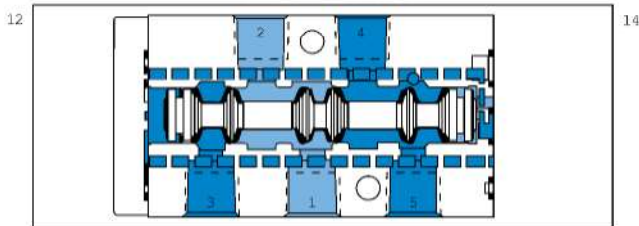
Single operator – Single inlet  
Shown with 12 operator energized

**Internal Pilot External Pilot Port**



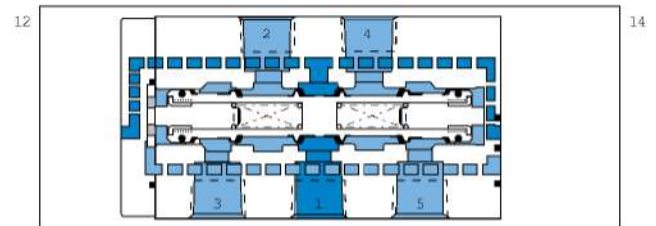
Single operator – Single inlet  
Shown with 12 operator energized

**Internal Pilot**



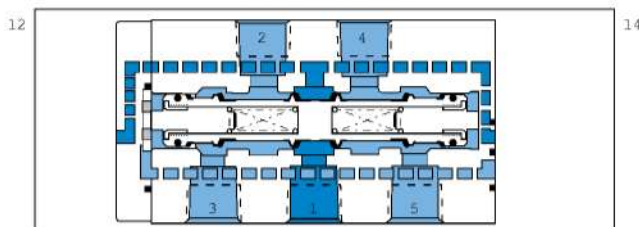
Single operator – Dual inlet  
Shown with 12 operator energized

**Internal Pilot**



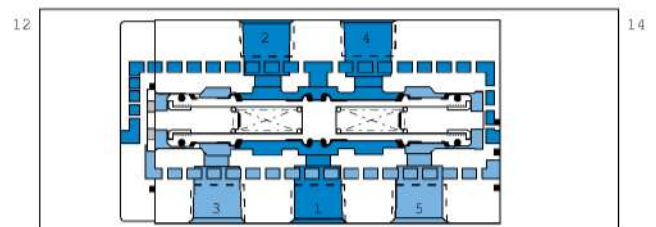
3 Position – Closed centre

**Internal Pilot**



3 Position – Open centre

**Internal Pilot**



3 Position – Pressure centre

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## MAC 400 Series - How to Order

### How to Order Electrical Version

**4 X X A - X X X - X X - X X X X - X X X**

PILOT VALVE - See below

SPOOL TYPE	BODY OPTIONS	PORT SIZE & THREAD TYPE IN. & CYL.	BASE CONFIGURATION	INT./EXT. PILOT
<ul style="list-style-type: none"> <li>0 Base only</li> <li>1 Sgl. oper. sgl. pres.</li> <li>2 Dbl. oper. sgl. pres.</li> <li>3 Sgl. oper. dual pres.</li> <li>4 Dbl. oper. dual pres.</li> <li>5 3 pos. closed centre</li> <li>6 3 pos. open centre</li> <li>7 3 pos. sgl. pres. - pres. centre</li> </ul>	<ul style="list-style-type: none"> <li>0 Base only</li> <li>1 Inline 5 port</li> <li>3 Manifold body (base mount body)</li> <li>4 Inline 5 port w/ memory</li> <li>6 Manifold body w/ memory</li> </ul>	<ul style="list-style-type: none"> <li>0 Manifold body</li> <li>A 1/8" NPTF</li> <li>B 1/4" NPTF</li> <li>C 1/8" BSPPL</li> <li>D 1/4" BSPPL</li> <li>E 1/8" BSPTR</li> <li>F 1/4" BSPTR</li> </ul>	<ul style="list-style-type: none"> <li>0 Inline or manifold body</li> <li>A Base standard ports</li> <li>B Base standard ports w/ flow controls</li> </ul>	<ul style="list-style-type: none"> <li>A Internal pilot (on dual press. models pilot press. is from port #5)</li> <li>B External pilot (inline body)</li> <li>C Internal pilot (on dual press. models pilot press. is from port #3)</li> <li>D External &amp; common external pilot (individual base &amp; bar manifold)</li> </ul>

### How to Order Remote Air Version

**4 X X A - X X X - RA**

Remote Air

SPOOL TYPE	BODY OPTIONS	PORT SIZE & THREAD TYPE IN. & CYL.	BASE CONFIGURATION	PILOT PORT
<ul style="list-style-type: none"> <li>*1 Sgl. oper. sgl. pres.</li> <li>2 Dbl. oper. sgl. pres.</li> <li>4 Dbl. oper. dual pres.</li> <li>5 3 pos. closed centre</li> <li>6 3 pos. open centre</li> <li>7 3 pos. sgl. pres. - pres. centre</li> </ul>	<ul style="list-style-type: none"> <li>1 Inline 5 port</li> <li>3 Manifold body (base mount body)</li> </ul>	<ul style="list-style-type: none"> <li>0 Manifold body</li> <li>A 1/8" NPTF</li> <li>B 1/4" NPTF</li> <li>C 1/8" BSPPL</li> <li>D 1/4" BSPPL</li> <li>E 1/8" BSPTR</li> <li>F 1/4" BSPTR</li> </ul>	<ul style="list-style-type: none"> <li>0 Inline or manifold body</li> <li>A Base standard ports</li> <li>B Base standard ports w/ flow controls</li> </ul>	<ul style="list-style-type: none"> <li>H Pilot port size #10-32</li> <li>J Pilot port size M5 (Metric)</li> </ul>

\* Requires MOD 1493

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## MAC 400 Series - How to Order

### How to Order Solenoid Operator

**DM - D XX X - X XX\***

VOLTAGE	LEAD WIRE LENGTH	MANUAL OVERRIDE	ELECTRICAL CONNECTOR*
JA 110 V~ / 50 Hz	0 No wires	0 No operator	BA Flying leads
JB 220 V~ / 50 Hz	A 45 cm	1 Non-locking recessed	BK Flying leads with protection diode
JC 24 V~ / 50 Hz	B 60 cm	2 Locking recessed	BL Flying leads with protection varistor
DA 24 V= / 5.4 W	C 90 cm	3 Non-locking extended	JB DIN 43650 - Industrial type B connector (male + female)
DB 12 V= / 5.4 W	D 120 cm	4 Locking extended	JD DIN 43650 - Industrial type B connector with light (male + female)
DC 12 V= / 7.5 W	E 180 cm		JM DIN 43650 - Industrial type B connector (male only)
DD 24 V= / 7.3 W	F 240 cm		KA DIN 43650 - Industrial type C connector
FA 12 V= / 1.8 W	J Connector		KB DIN 43650 - Industrial type C connector with protection diode
FB 24 V= / 1.8 W			KJ DIN 43650 - Industrial type C connector with protection varistor
FE 12 V= / 2.4 W			TA Dual tabs with receptacles
FF 24 V= / 2.4 W			TB TA with protection diode

\* Other options available, see page 11

**GM - G XX X - X XX\***

VOLTAGE	LEAD WIRE LENGTH	MANUAL OVERRIDE	ELECTRICAL CONNECTOR*
DC 24 V= / 1.8 W	0 No wires	1 Non locking recessed	BA Flying leads w/o ground wire
DD 24 V= / 2.5 W	A 45 cm	3 Non locking extended	BB Flying leads w/ ground wire
DE 24 V= / 3.0 W	B 60 cm		BT Flying leads with LED light on top (no ground wire)
DF 24 V= / 4.0 W	C 90 cm		KA Plug-in wire assembly (no ground wire)
DJ 12 V= / 1.8 W	D 120 cm		KB Plug-in wire assembly w/ ground wire
DK 12 V= / 2.5 W	E 180 cm		KT Plug-in wire assembly w/ LED light on top
DM 12 V= / 3.0 W	F 240 cm		
DN 12 V= / 4.0 W	G 305 cm		
ED 120 V= / 2.5 W	H 366 cm		

\* Other options available, see page 12

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## MAC 400 Series - References for DM Pilot Valves

Codification table for voltages / Manual override / Electrical connection

VALVE CODE □ **-DM- XX X-X XX**  
1 2 3 4

\* From Lead wire length options choose A through F

Note: When coil is above 30 volts, a ground wire is required. Applies to options with flying leads.

### 1. VOLTAGE

D-XX X-X XX	VOLTAGE
DA	24V=/5,4W
DB	12V=/5,4W
DC	12V=/7,5W
DD	24V=/7,3W
DE	12V=/12,7W
DF	24V=/12,7W
DK	110V=/4,7W
DJ	28V=/5,2W
DL	64V=/6W
DM	36V=/5,3W
DN	6V=/6W
DR	90V=/6,6W
DS	110V=/7,3W
DT	75V=/5,6W
DP	48V=/5,8W
FA	12V=/1,8W
FB	24V=/1,8W
FE	12V=/2,4W
FF	24V=/2,4W
JA	120V~/60Hz, 110V~/50Hz (2,9W)
JB	240V~/60Hz, 220V~/50Hz (2,9W)
JC	24V~/60Hz, 24V~/50Hz (3,7W)
JD	100V~/60Hz, 100V~/50Hz, 110V~/60Hz (3,9W)
JE	220V~/60Hz (3,4W)
JF	240V~/50Hz (2,8W)
JG	200V~/60Hz, 200V~/50Hz (3,9W)

### 2. WIRE LENGTH

D-XX X-X XX	WIRE LENGTH
0	No wires
A	45 cm – 18"
B	60 cm – 24"
C	90 cm – 36"
D	120 cm – 48"
E	180 cm – 72"
F	240 cm – 96"
J	Connector

### 3. MANUAL OVERRIDE

D-XX X-X XX	MANUAL OVERRIDE
0	No operator
1	Non-locking recessed
2	Locking recessed
3	Non-locking extended
4	Locking extended

### 4. ELECTRICAL CONNECTION

D-XX X-X XX	ELECTRICAL CONNECTION
BA*	Flying leads
BK*	BA with protection diode
BL*	BA with protection varistor
CA*	1/2" NPS conduit with flying leads
CM*	1/2" NPS metal conduit with flying leads
CN*	1/2" NPS metal conduit with flying leads & ground
CK	1/2" NPS conduit with diode
CL	1/2" NPS conduit with MOV
HA	MAC JAC plug-in
HB	MAC JAC plug-in with light
HC	MAC JAC plug-in with diode & light
JB	DIN 43650 - Industrial type B connector (male + female)
JD	DIN 43650 - Industrial type B connector with light (male + f.)
JM	DIN 43650 - Industrial type B connector (male only)
JA	DIN 43650 - Industrial type A connector (male + female)
JC	DIN 43650 - Industrial type A connector with light (male + f.)
JJ	DIN 43650 - Industrial type A connector (male only)
KA	DIN 43650 - Industrial type C connector
KB	DIN 43650 - Industrial type C connect. with protection diode
KC	DIN 43650 - Industrial type C conn. with protection varistor
KD	DIN 43650 - Industrial type C connector with light
KE	DIN 43650 - Indust. type C conn. w/ light & protection diode
KF	DIN 43650 - Indust. type C conn. w/ light & protection varistor
KG	DIN 43650 - Industrial type C connector with light & diode
KJ	DIN 43650 - Industrial type C connector (male only)
KK	DIN 43650 - Indust. type C conn. w/ protection diode (male)
KL	DIN 43650 - Indust. type C conn. w/ protection varistor (male)
LA	ISO 15217 standard connector plug-in (male only)
LB	ISO 15217 standard connector plug-in with diode (male only)
LC	ISO 15217 standard connector plug-in with MOV (male only)
LJ	ISO 15217 standard connector plug-in (male only)
LK	ISO 15217 standard connector plug-in with diode (male only)
LL	ISO 15217 standard connector plug-in with MOV (male only)
PA	Pico M8 (male only)
TA	Dual tabs with receptacles
TB	TA with protection diode
TD	TA with light
TE	TA with light and protection diode
TJ	Dual tabs (male only)
TK	TJ with protection diode
TM	TJ with light
TN	TJ with light and protection diode
RA	Euro (M12) - 2 Pin
RB	Euro (M12) - 2 Pin with diode (male only)
RC	Euro (M12) - 2 Pin with MOV
RD	Euro (M12) - 2 Pin with light
RE	Euro (M12) - 2 Pin with diode & light
RF	Euro (M12) - 2 Pin with MOV & light

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## MAC 400 Series - References for GM Pilot Valves

Codification table for voltages / Manual override / Electrical connection

VALVE CODE ☒ **-GM- XX X-X XX**  
1 2 3 4

### 1. VOLTAGE

G-XX X-X XX	VOLTAGE
DC	24 V =/1.8 W
DD	24 V =/1.8 W
DE	24 V =/3.0 W
DF	24 V =/4.0 W
DJ	12 V =/1.8 W
DK	12 V =/2.5 W
DM	12 V =/3.0 W
DN	12 V =/4.0 W

### 2. WIRE LENGTH

G-XX X-X XX	WIRE LENGTH
0	No lead wire (use only with "KJ" & "KM" electrical connectors)
A	45 cm - 18"
B	60 cm - 24"
C	90 cm - 36"
D	120 cm - 48"
E	180 cm - 72"
F	240 cm - 96"
G	300 cm - 120"
H	365 cm - 144"

### 3. MANUAL OVERRIDE

G-XX X-X XX	MANUAL OPERATOR
1	Non-locking recessed
2	Locking recessed
3	Non-locking extended
4	Locking extended

### 4. ELECTRICAL CONNECTION

G-XX X-X XX	ELECTRICAL CONNECTION
BA	Flying leads
BB	Flying leads with ground wire
BC	Flying leads with LED light parallel to leads
BD	Flying leads with LED light parallel to leads & ground wire
BE	Flying leads with suppression diode
BF	Flying leads with supp. diode & ground wire
BG	Flying leads with supp. diode plus LED light parallel to leads
BH	Flying leads with supp. diode plus LED light parallel to leads & ground wire
BN	Flying leads with supp. diode plus blocking diode
BP	Flying leads w/ supp. diode plus blocking diode & ground wire
BR	Flying leads w/ supp. diode plus blocking diode & LED light parallel to leads
BS	Flying leads with supp. diode plus blocking diode & LED light parallel to leads & Ground Wire

BT	Flying leads with LED light on top
BU	Flying leads with LED light on top & ground wire
BV	Flying leads with supp. diode plus LED light on top
BW	Flying leads w/ supp. diode plus LED light on top & ground wire
BX	Flying leads w/ supp. diode plus blocking diode & LED on top
BY	Flying leads with supp. diode plus blocking diode & LED on top & ground wire

### 4. ELECTRICAL CONNECTION

G-XX X-X XX	SOLENOID PLUG-IN CONNECTOR WITH LEADS
GA*	MAC JAC Solenoid plug-in
GB*	MAC JAC Solenoid plug-in with diode
GC*	MAC JAC Solenoid plug-in with MOV
GD*	MAC JAC Solenoid plug-in with light
GE*	MAC JAC Solenoid plug-in with diode & light
GF*	MAC JAC Solenoid plug-in with MOV & light
GG*	MAC JAC Solenoid plug-in with rectifier
GH*	MAC JAC Solenoid plug-in with rectifier & light
GJ*	MAC JAC Solenoid plug-in (male only)
GK*	MAC JAC Solenoid plug-in with diode (male only)
GL*	MAC JAC Solenoid plug-in with MOV (male only)
GM*	MAC JAC Solenoid plug-in with LED (male only)
GN*	MAC JAC Solenoid plug-in with diode & LED (male only)
GP*	MAC JAC Solenoid plug-in with MOV & LED (male only)
GR*	MAC JAC Solenoid plug-in with rectifier (male only)
GS*	MAC JAC Solenoid plug-in with rectifier & LED (male only)
HA	Circuit board plug-in w/ full wave rectifier & LED (w/ ground wire)
HD	Same as "HA" without lead wire assembly
KA	Plug-in wire assembly
KB	Plug-in wire assembly with ground wire
KC	Solenoid plug-in wire assembly with rectifier and LED
KD	Solenoid plug-in wire ass. w/ rectifier and LED w/ ground
KE	Plug-in wire assembly w/ suppression diode
KF	Plug-in wire assembly w/ suppression diode & ground wire
KJ	Plug-in without wire assembly for "KA" above
KM	Plug-in without wire assembly for "KB" above
KN	Plug-in wire assembly w/ suppr. diode plus blocking diode
KP	Plug-in wire ass. w/ suppr. diode + blocking diode & ground wire
KT	Plug-in wire assembly with LED light on top (no ground wire)
KU	Plug-in wire assembly with LED light on top & ground wire
KV	Plug-in wire assembly with supp. diode plus LED light on top
KW	Plug-in wire ass. w/ supp. diode + LED light on top & ground wire
KX	Plug-in wire ass. w/ supp. diode + block. diode & LED light on top
KY	Plug-in wire assembly with suppression diode plus blocking diode & LED light on top & ground wire
PA	Pico
TJ	Dual Tabs - Mini Plug-in

Note: Blocking diode is located in the lead wire

\* MAC JAC Connector not available with AC Voltage options

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## MAC 400 Series - Codification Electrical Connection DM Pilot Valve (Coil / Connector configurations)

	<ul style="list-style-type: none"> <li>BA* Flying leads</li> <li>BK* BA with protection diode</li> <li>BL* BA with protection varistor</li> </ul> <p>* From lead wire length options choose</p>		<ul style="list-style-type: none"> <li>CA* 1/2" NPS conduit with flying leads</li> <li>CM* 1/2" NPS metal conduit with flying leads</li> <li>CN* 1/2" NPS metal conduit with flying leads &amp; ground</li> <li>CK 1/2" NPS conduit with diode</li> <li>CL 1/2" NPS conduit with MOV</li> </ul> <p>* From lead wire length options choose</p>
	<ul style="list-style-type: none"> <li>HA MAC JAC plug-in</li> <li>HB MAC JAC plug-in with light</li> <li>HC MAC JAC plug-in with diode &amp; light</li> </ul>		<ul style="list-style-type: none"> <li>JB DIN 43650 - Industrial type B connector (male + female)</li> <li>JD DIN 43650 - Industrial type B connector with light (male + female)</li> <li>JM DIN 43650 - Industrial type B connector (male only)</li> </ul> <p style="text-align: center;">11mm pin spacing</p>
	<ul style="list-style-type: none"> <li>JA DIN 43650 - Industrial type A connector (male + female)</li> <li>JC DIN 43650 - Industrial type A connector with light (male + female)</li> <li>JJ DIN 43650 - Industrial type A connector (male only)</li> </ul> <p style="text-align: center;">Form A - 18mm pin spacing</p>		<ul style="list-style-type: none"> <li>KA DIN 43650 - Industrial type C connector</li> <li>KB DIN 43650 - Industrial type C connector with protection diode</li> <li>KC DIN 43650 - Industrial type C connector with protection varistor</li> <li>KD DIN 43650 - Industrial type C connector with light</li> <li>KE DIN 43650 - Industrial type C connector with light and protection diode</li> <li>KF DIN 43650 - Industrial type C connector with light and protection varistor</li> <li>KG DIN 43650 - Industrial type C connector with light &amp; diode</li> <li>KJ DIN 43650 - Industrial type C connector (male only)</li> <li>KK DIN 43650 - Industrial type C connector with protection diode (male only)</li> <li>KL DIN 43650 - Industrial type C connector with protection varistor (male only)</li> </ul>
	<ul style="list-style-type: none"> <li>LA ISO 15217 standard connector plug-in (male only)</li> <li>LB ISO 15217 standard connector plug-in with diode (male only)</li> <li>LC ISO 15217 standard connector plug-in with MOV (male only)</li> <li>LI ISO 15217 standard connector plug-in (male only)</li> <li>LK ISO 15217 standard connector plug-in with diode (male only)</li> <li>LL ISO 15217 standard connector plug-in with MOV (male only)</li> </ul>		<ul style="list-style-type: none"> <li>PA Pico M8 (male only)</li> </ul> <p style="text-align: center;">8mm</p> <p style="text-align: center;">M* 2-pin thread or snap fit</p>
	<ul style="list-style-type: none"> <li>TA Dual tabs with receptacles</li> <li>TB TA with protection diode</li> <li>TD TA with light</li> <li>TE TA with light and protection diode</li> <li>TJ Dual tabs (male only)</li> <li>TK TJ with protection diode</li> <li>TM TJ with light</li> <li>TN TJ with light and protection diode</li> </ul>		<ul style="list-style-type: none"> <li>RA Euro (M12) - 2 Pin</li> <li>RB Euro (M12) - 2 Pin with diode (male only)</li> <li>RC Euro (M12) - 2 Pin with MOV</li> <li>RD Euro (M12) - 2 Pin with light</li> <li>RE Euro (M12) - 2 Pin with diode &amp; light</li> <li>RF Euro (M12) - 2 Pin with MOV &amp; light</li> </ul>

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## MAC 400 Series - Codification Electrical Connection GM Pilot Valve (Coil / Connector configurations)



BA	Flying leads
BB	Flying leads with ground wire
BC	Flying leads with LED light parallel to leads
BD	Flying leads with LED light parallel to leads & ground wire
BE	Flying leads with suppression diode
BF	Flying leads with supp. diode & ground wire
BG	Flying leads with supp. diode plus LED light parallel to leads
BH	Flying leads with supp. diode plus LED light parallel to leads & ground wire
BN	Flying leads with supp. diode plus blocking diode
BP	Flying leads with supp. diode plus blocking diode & ground wire
BR	Flying leads with supp. diode plus blocking diode & LED light parallel to leads
BS	Flying leads with supp. diode plus blocking diode & LED light parallel to leads & Ground Wire
BT	Flying leads with LED light on top
BU	Flying leads with LED light on top & ground wire
BV	Flying leads with supp. diode plus LED light on top
BW	Flying leads with supp. diode plus LED light on top & ground wire
BX	Flying leads with supp. diode plus blocking diode & LED on top
BY	Flying leads with supp. diode plus blocking diode & LED on top & ground wire

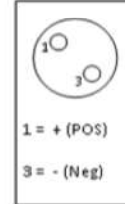


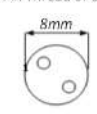
KA	Plug-in wire assembly
KB	Plug-in wire assembly with ground wire
KC	Solenoid plug-in wire assembly with rectifier and LED
KD	Solenoid plug-in wire assembly with rectifier and LED with ground
KE	Plug-in wire assembly w/ suppression diode
KF	Plug-in wire assembly w/ suppression diode & ground wire
KJ	Plug-in without wire assembly for "KA" above
KM	Plug-in without wire assembly for "KB" above
KN	Plug-in wire assembly with suppression diode plus blocking diode
KP	Plug-in wire assembly with suppression diode plus blocking diode & ground wire
KT	Plug-in wire assembly with LED light on top (no ground wire)
KU	Plug-in wire assembly with LED light on top & ground wire
KV	Plug-in wire assembly with supp. diode plus LED light on top
KW	Plug-in wire assembly with supp. diode plus LED light on top & ground wire
KX	Plug-in wire assembly with suppression diode plus blocking diode & LED light on top
KY	Plug-in wire assembly with suppression diode plus blocking diode & LED light on top & ground wire



GA*	MAC JAC Solenoid plug-in
GB*	MAC JAC Solenoid plug-in with diode
GC*	MAC JAC Solenoid plug-in with MOV
GD*	MAC JAC Solenoid plug-in with light
GE*	MAC JAC Solenoid plug-in with diode & light
GF*	MAC JAC Solenoid plug-in with MOV & light
GG*	MAC JAC Solenoid plug-in with rectifier
GH*	MAC JAC Solenoid plug-in with rectifier & light
GJ*	MAC JAC Solenoid plug-in (male only)
GK*	MAC JAC Solenoid plug-in with diode (male only)
GL*	MAC JAC Solenoid plug-in with MOV (male only)
GM*	MAC JAC Solenoid plug-in with LED (male only)
GN*	MAC JAC Solenoid plug-in with diode & LED (male only)
GP*	MAC JAC Solenoid plug-in with MOV & LED (male only)
GR*	MAC JAC Solenoid plug-in with rectifier (male only)
GS*	MAC JAC Solenoid plug-in with rectifier & LED (male only)

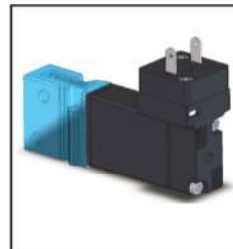
\* MAC JAC Connector not available with AC Voltage options



PA	Pico
<i>M* 2-Pin Thread or Snap Fit</i>	
	



HA	Circuit board plug-in with full wave rectifier & LED (with ground wire)
HD	Same as "HA" without lead wire assembly



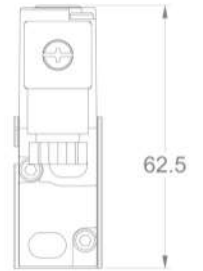
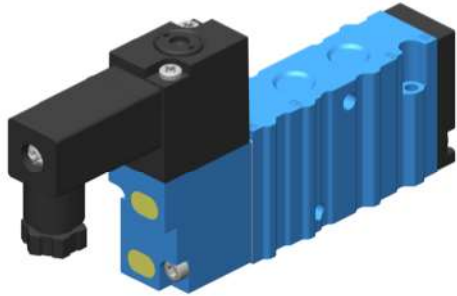
TJ	Dual Tabs - Mini Plug-in
<i>MICRO DIN 43650-Industrial Standard C</i> <i>9.4mm Pin Spacing</i>	
	

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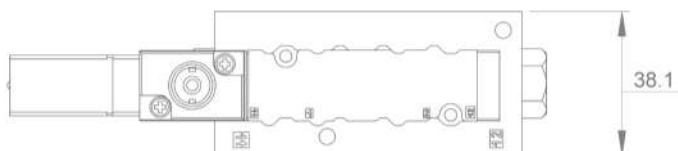
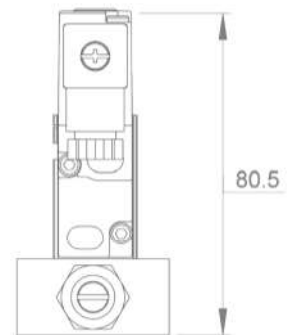
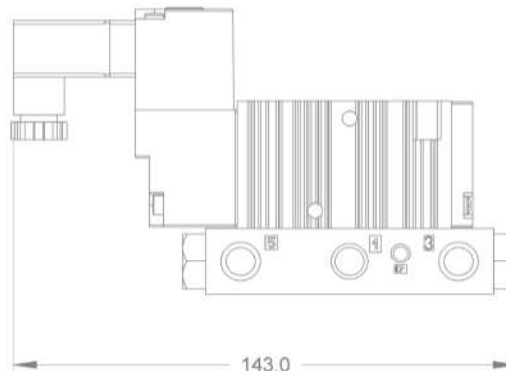
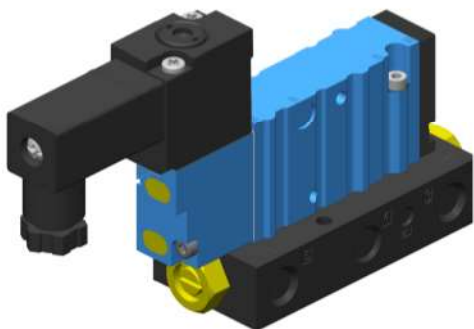
## MAC 400 Series - Dimensions

### 400 Series - Inline Valve

All dimensions are in mm



### 400 Series - Individual Base



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## MAC 400 Series - Repair Kits (Main ones)

PART REFERENCE	DESCRIPTION
K-04001	Repair kit 2 position, single pressure, single operator
K-04001-01	Repair kit 2 position, single pressure, single operator with memory spring
K-04002	Repair kit 2 position, single pressure, double operator
K-04003	Repair kit 2 position, dual pressure, single operator
K-04003-01	Repair kit 2 position, dual pressure, single operator with memory spring
K-04004	Repair kit 2 position, dual pressure, double operator
K-04005	Repair kit 3 position, closed centre, single pressure
K-04006	Repair kit 3 position, open centre, single pressure
K-04007	Repair kit 3 position, single pressure, pressure centre
S-04001	Spool assembly 2 position, single pressure
S-04002	Spool assembly 2 position, single pressure - memory spring type
S-04003	Spool assembly 2 position dual pressure
S-04004	Spool assembly 2 position dual pressure - memory spring type
S-04005	Spool assembly 3 position, single pressure, closed centre
S-04006	Spool assembly 3 position, single pressure, open centre
S-04007	Spool assembly 3 position, single pressure, pressure centre
DM-D...-...	Complete pilot valve (45 series type)
GM-G...-...	Complete pilot valve (44 series type)
16524	Pressure seal - pilot valve to body
16525	Body to base pressure seal (manifold body)
17013-01	O-Ring (2x) with manifold base (inline body)
17015-01	O-Ring (1x) port seal with manifold base (inline body)

MOST COMMON MODIFICATIONS	DESCRIPTION
1080	Namur interface
T65C	High temperatures
532B	Washdown IP65
0650	Food applications

For other modifications, please consult factory

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## MAC 400 Series - Circuit Bar®



MID PROFILE CIRCUIT BAR  
CYLINDER PORTS IN VALVE



ADD-A-UNIT STATIONS  
FOR CBM404A BAR

## Design Description

### General

The 400 series circuit bar® is available in five different configurations. The Low Profile version (CBM401A & CBM402A), the Mid Profile version (CBM403A & CBM404A), and the High Profile version (CBM405A). Each bar is machined from a single block extruded black anodized aluminium to provide a common inlet and dual common exhaust. The Mid and High Profile versions offer a common external pilot and an add-on version option which provides a means to attach additional stations to the circuit bar®.

### Electrical

Each circuit bar® is a non plug-in bar. All electrical connections are made at the solenoid. Wire and optional prewired cables are available.

### Valving

Inline and manifold type valves can be mounted on the circuit bars®. The common inlet and exhausts can be isolated to provide different pressures. Valves using both style pilot valves (44 and 45 series) can be mounted on the same circuit bar®.

### Porting

The common inlet and exhausts have a 3/8" tapped port. The Low Profile and Mid Profile bars are available with 1/8" and 1/4" bottom ports only. The High Profile bar is available with 1/8" and 1/4" side ports only.

### Accessories

The Low Profile and Mid Profile bars are available with individual exhaust flow controls. Flow controls are not available on the High Profile version. An end plate kit is supplied with the add-on version type bar. A blank station valve cover plate is available for all circuit bars®.

	CBM401	CBM402	CBM403	CBM404	CBM405
Height	32	32	38	38	52
Cylinder ports in valve	Yes	No	Yes	No	No
Cylinder ports in base	No	Yes, bottom	No	Yes, bottom	Yes, side + bottom
Flow controls	Yes	Yes	Yes	Yes	Yes
Common Pilot	Internal	Internal	Internal / External	Internal	Internal / External
Cylinder Port Size	/	1/8	/	1/8 - 1/4	1/8 - 1/4

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## MAC 400 Series - Circuit Bar®

### How to Order Low Profile Bar (32 mm)

**CBM40 1 A - X X X X X - X X**

Number of Stations

BAR PROFILE (HEIGHT)	SPACING	CONFIGURATION	STYLE	PORT SIZE (COMMON PORTS)
1 Low Profile (32 mm)	00 19.5 mm (Standard) 02 26 mm (conduit & rect. pin type connectors)	A Inline body B Inline body with F.C.	A Standard	A 3/8" NPTF B 3/8" BSPPL C 3/8" BSPTR

### Replacement Parts & Accessories

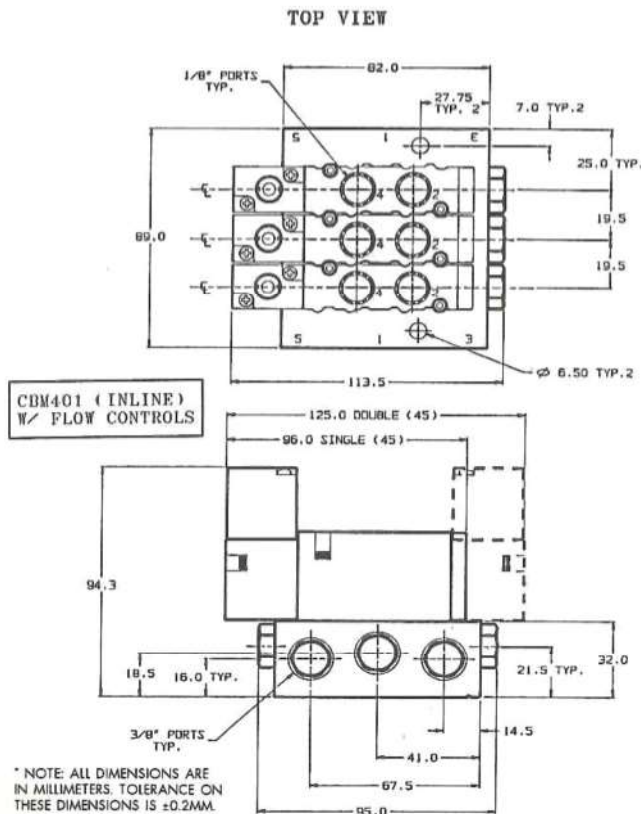
M-04001	Blank station kit for 5-port inline body
N-04001	Flow control assembly (2 per station)
17013-01	O-Ring port seal (2 per station)
17015-01	O-Ring port seal (1 per station)
35043	Body to bar manifold mounting screw (2 per valve)

### Ordering Example

**CBM401A-00BAA-06**  
Low profile bar, 19.5 mm spacing, for 5-port inline body, with flow controls, 3/8" NPTF common ports, six identical stations.

### Dimensions

All dimensions are in mm



Drawing for a low profile bar, cylinder ports in valve

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## MAC 400 Series - Circuit Bar®

### How to Order Low Profile Bar (32 mm) - For Manifold Body

**CBM40 2 A - X X X X X - X X - 9\***

Number of Stations

BAR PROFILE (HEIGHT)	SPACING	CONFIGURATION	STYLE	PORT SIZE (CYLINDER PORTS)
2 Low Profile (32 mm) For manifold body	00 19.5 mm (Standard) 02 26 mm (conduit & rect. pin type connectors)	A Manifold body Bottom cyl. ports B Manifold body - Bottom cyl. ports & flow controls	A Standard bar	A 1/8" NPTF B 1/8" BSPPL C 1/8" BSPTR

### Replacement Parts & Accessories

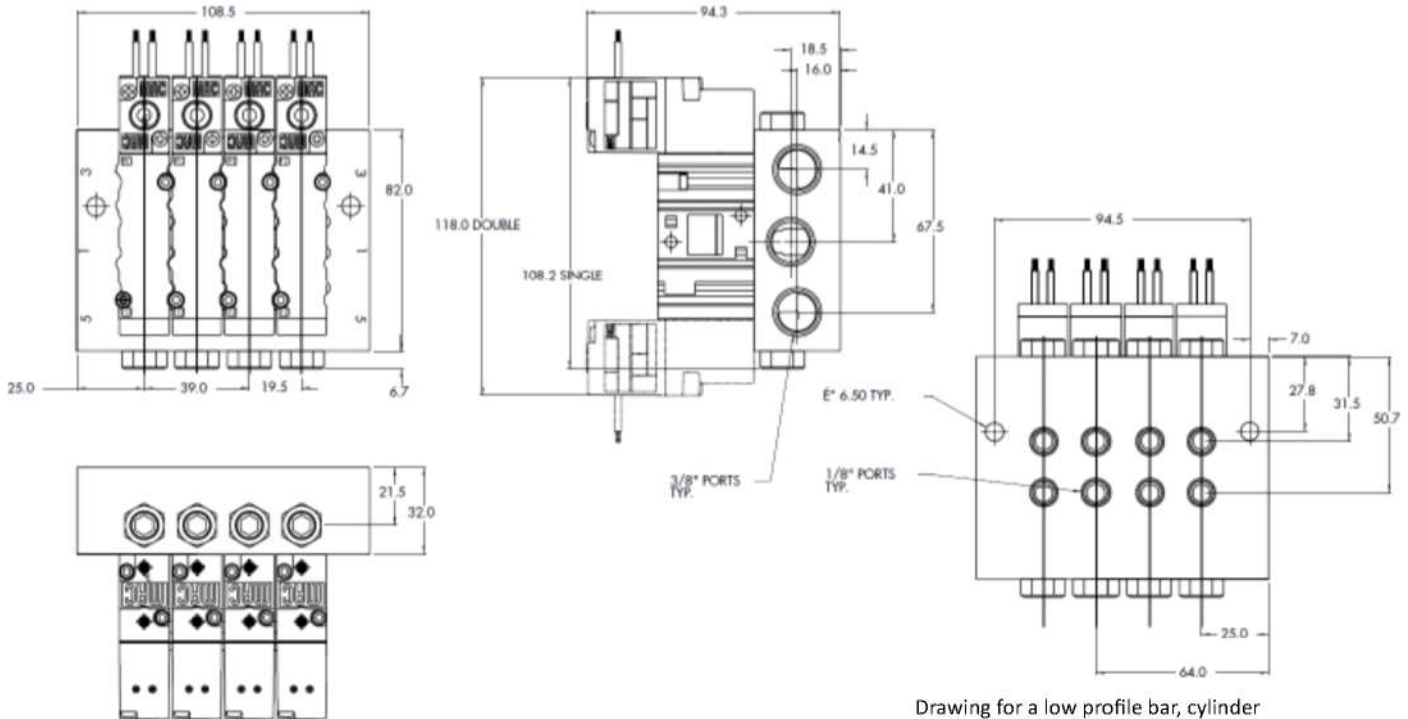
M-04002	Blank station kit for manifold body
N-04001	Flow control assembly (2 per station)
16525	Body to base pressure seal, manifold body bar
35043	Body to bar mounting screw (2 per station)

### Ordering Example

**CBM402A-00AAB-06**  
Low profile bar, 19.5 mm spacing, for manifold bodies, bottom cylinders 1/8" BSPPL, six identical stations.

### Dimensions

All dimensions are in mm



Drawing for a low profile bar, cylinder ports in base

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## MAC 400 Series - Circuit Bar®

### How to Order Mid Profile Bar (38 mm)

**CBM40 3 A - X X X X X - X X - 9\***

Number of Stations

BAR PROFILE (HEIGHT)	SPACING	CONFIGURATION	STYLE	PORT SIZE (COMMON PORTS)
3 Mid Profile (38 mm)	<b>00</b> 19.5 mm (Standard) <b>01</b> 21 mm <b>02</b> 26 mm (conduit & rect. pin type connectors)	<b>A</b> Inline body <b>B</b> Inline body with F.C. <b>C</b> Inline body Common external pilot <b>D</b> Inline body with F.C. Common external pilot	<b>A</b> Standard bar <b>B</b> Add-on version <b>C</b> Add-on version Common external pilot <b>E</b> Add-on right hand stations (21 mm min.)	<b>A</b> 3/8" NPTF <b>B</b> 3/8" BSPPL <b>C</b> 3/8" BSPTR

Right-hand end plate kit included w/ bar ass'y on "B" & "C" style add-on versions

### Replacement Parts & Accessories

- M-04003-01** Right-hand end plate kit, for mid profile bars (NPTF)
- M-04003-01P** Right-hand end plate kit, for mid profile bars (BSPPL)
- M-04004-01** Right-hand end plate kit, mid profile/ common ext. pilot (NPTF)
- M-04004-01P** Right-hand end plate kit, mid profile/ common ext. pilot (BSPPL)
- M-04001** Blank station kit for 5-port inline body
- N-04001** Flow control assembly (2 per station)
- 17013-01** O-Ring body port seal (2 per station)
- 17015-01** O-Ring body port seal (1 per station)
- 35043** Body to body mounting screw (2 per station)

### Ordering Examples

#### CBM403A-00CCA-06

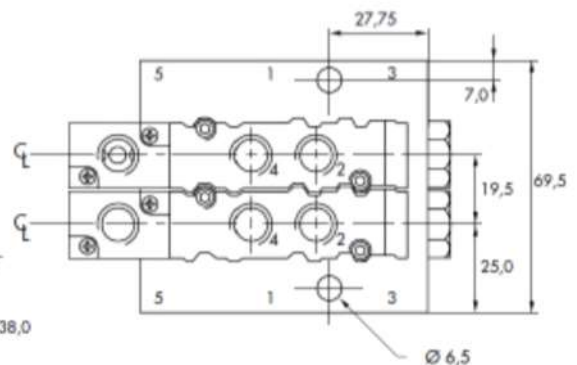
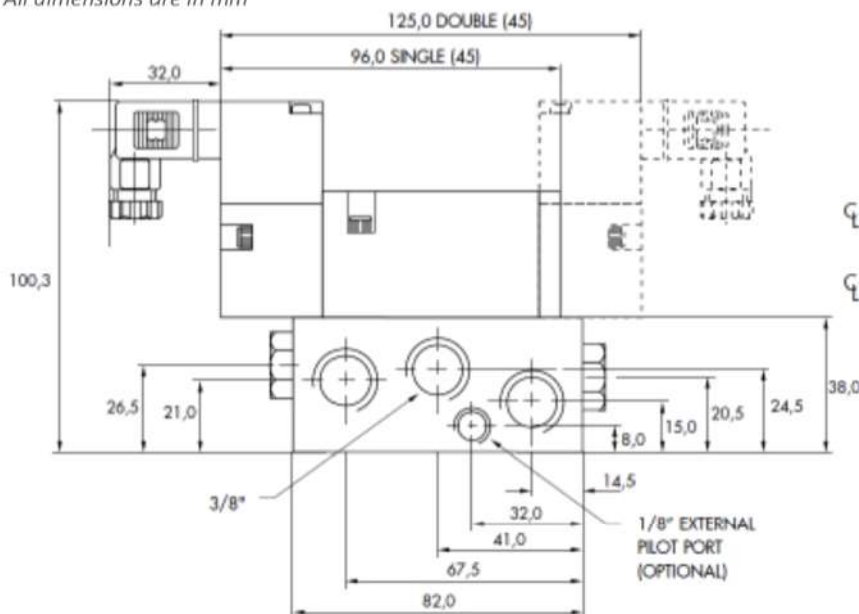
Mid profile bar, 19.5 mm spacing, for 5-port inline body, common external pilot, 3/8" NPTF common ports add-on version, six identical stations.

#### CBM403A-01CEA-01

Mid profile bar, 21 mm spacing, for 5-port inline body, common external pilot, 3/8" NPTF common ports, single unit for add-on version, can be added to above example bar.

### Dimensions

All dimensions are in mm



Drawing for a mid profile bar, cylinder ports in valve

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## MAC 400 Series - Circuit Bar®

How to Order Mid Profile Bar (38 mm) - For manifold body

**CBM40 4 A - X X X X - X X - 9\***

Number of Stations

BAR PROFILE (HEIGHT)	SPACING	CONFIGURATION	STYLE	PORT SIZE (CYLINDER PORTS)
4 Mid Profile (38 mm) For manifold body	00 19.5 mm (Standard) 01 21 mm 02 26 mm (conduit & rect. pin type connectors)	A Manifold body Bottom cyl. ports B Manifold body - Bottom cyl. ports & flow controls	A Standard bar B Add-on version E Add-on right hand stations (21 mm min.)	A 1/8" NPTF B 1/8" BSPPL C 1/8" BSPTR D 1/4" NPTF E 1/4" BSPPL F 1/4" BSPTR

Right-hand end plate kit included w/ bar ass'y on "B" style add-on version

### Replacement Parts & Accessories

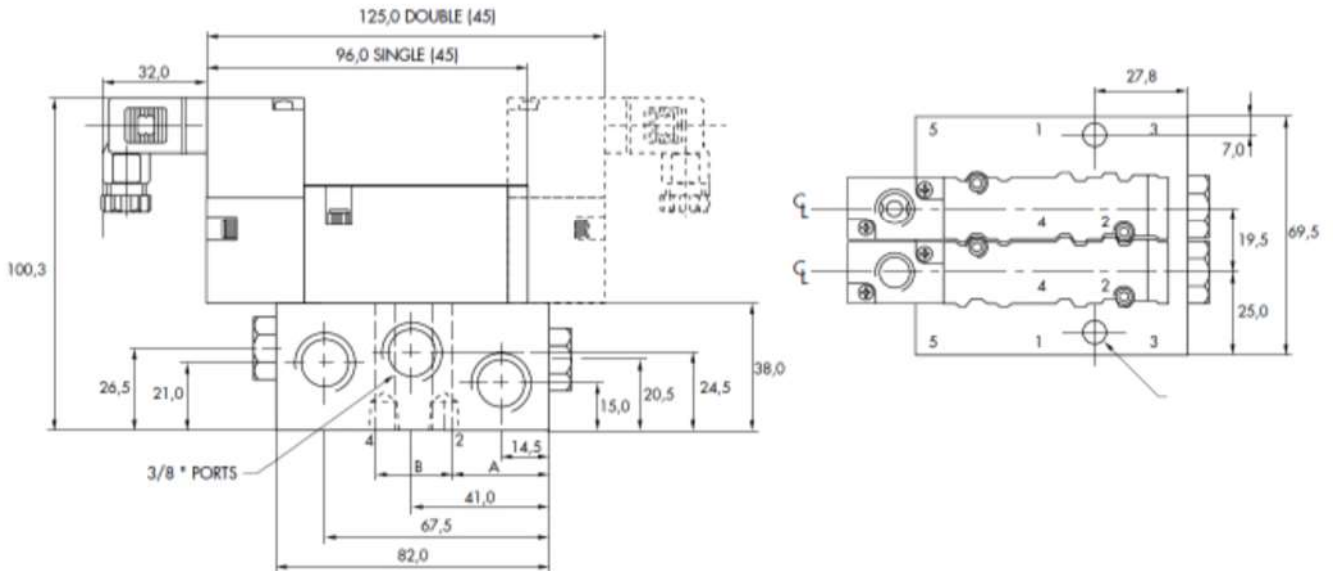
<b>M-04003-01</b>	Right-Hand end plate kit, for mid profile bar (NPTF)
<b>M-04003-01P</b>	Right-Hand end plate kit, for mid profile bar (BSPPL)
<b>M-04002</b>	Blank station kit for manifold body
<b>N-04001</b>	Flow control assembly (2 per station)
<b>16525</b>	Body to base pressure seal, manifold body
<b>35043</b>	Body to bar mounting screw (2 per station)

### Ordering Examples

- CBM404A-00ABA-06**  
Mid profile bar, 19.5 mm spacing, for manifold bodies, bottom cylinders 1/8" NPTF, add-on version, six identical stations.
- CBM404A-01AEA-01**  
Mid profile bar, 21 mm spacing, for manifold body, bottom cyl's 1/8" NPTF, single unit for add-on version, can be added to above example bar

### Dimensions

All dimensions are in mm



Drawing for a mid profile bar, cylinder ports in base

Port size	A	B
1/8"	31.5	19.0
1/4"	32.0	20.0

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## MAC 400 Series - Circuit Bar®

### How to Order High Profile Bar (52 mm)

**CBM40 5 A - X X X X X - X X - 9\***

Number of Stations

BAR PROFILE (HEIGHT)	SPACING	CONFIGURATION	STYLE	PORT SIZE (CYLINDER PORTS)
5 High Profile (52 mm)	00 19.5 mm (Standard) 01 21 mm 02 26 mm (conduit & rect. pin type connectors)	A Manifold body Bottom cyl. ports B Manifold body - Side cyl. ports & common external pilot	A Standard bar B Add-on version C Add-on version Common external pilot E Add-on right hand stations (21 mm min.)	A 1/8" NPTF B 1/8" BSPPL C 1/8" BSPTR D 1/4" NPTF E 1/4" BSPPL F 1/4" BSPTR

Right-hand end plate kit included w/ bar ass'y on "B" & "C" style add-on versions

### Replacement Parts & Accessories

M-04005-01	Right-Hand end plate kit, for high profile bars (NPTF)
M-04005-01P	Right-Hand end plate kit, for high profile bars (BSPPL)
M-04006-01	Right-Hand end plate kit, high profile/common ext. pilot (NPTF)
M-04006-01P	Right-Hand end plate kit, high profile/common ext. pilot (BSPPL)
M-04002	Blank station kit for manifold body
16525	Body to base pressure seal, manifold body
35043	Body to bar mounting screw (2 per station)

### Ordering Examples

#### CBM405A-00ABD-06

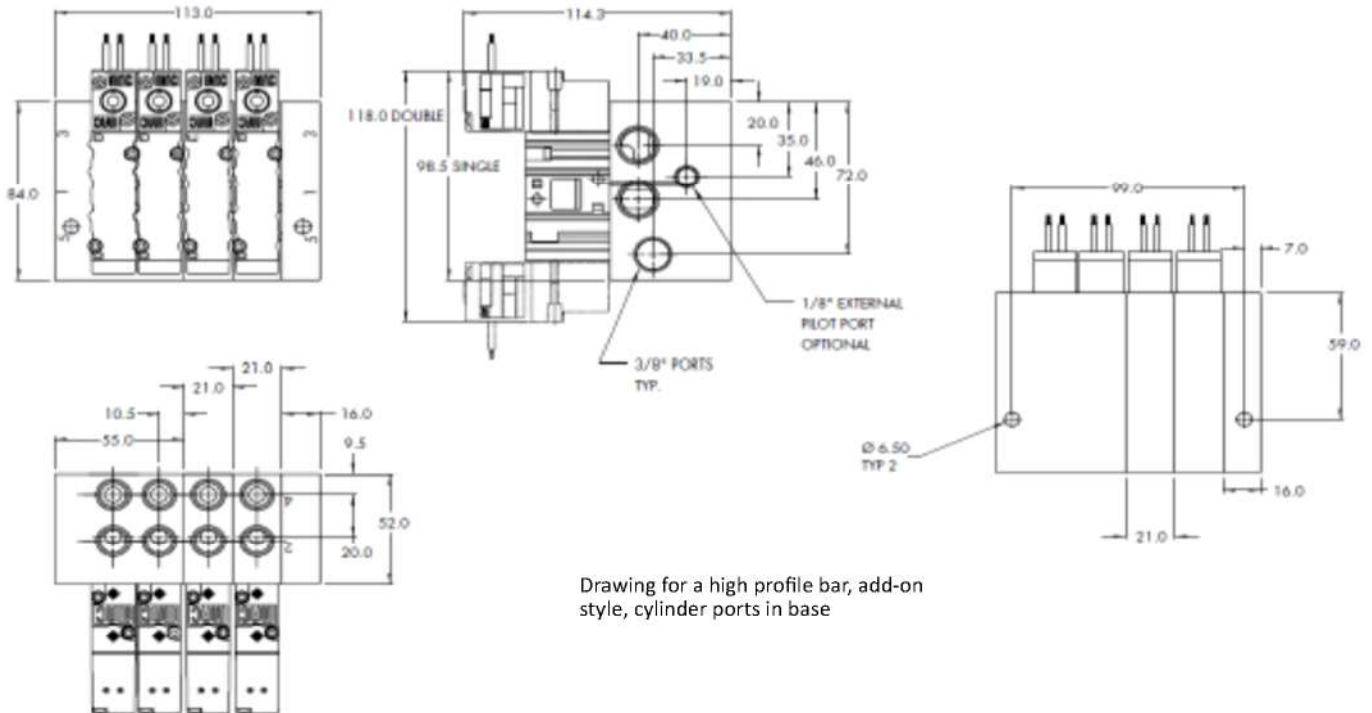
High profile bar, 19.5 mm spacing for manifold body, side cylinders 1/4" NPTF, add-on version, six identical stations.

#### CBM405A-01AEA-01

High profile bar, 21 mm spacing, for manifold body, side cyl's 1/4" NPTF, single unit for add-on version, can be added to above example bar

### Dimensions

All dimensions are in mm



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## MAC 400 Series Valve

### MAC 400 Series - Warranty

The MAC Valves organization has established a reputation over many years for fulfilling the needs and requirements of the users of its products. All MAC Valves are quality products specifically designed and built for long and rugged service. For this reason, MAC Valves is able to provide the Buyer a limited warranty.

**WARRANTY:** MAC Valves, Inc. hereby warrants to Buyer that, for a period of 18 months from the original date of shipment of each valve from our factory ("Warranty Period"), such valve will be free from significant defects in material and workmanship and will conform to all specifications agreed to by MAC Valves, Inc.. In addition, MAC Valves, Inc. warrants that the electrical coils on such valves will be free from significant defects in material and workmanship for their normal useful life.

EXCEPT FOR THESE LIMITED WARRANTIES, MAC VALVES, INC. EXPRESSLY DISCLAIMS ALL REPRESENTATIONS AND WARRANTIES OF ANY KIND (WHETHER EXPRESS, IMPLIED OR ARISING BY OPERATION OF LAW) WITH RESPECT TO THE VALVES, INCLUDING, WITHOUT LIMITATION, ANY WARRANTIES OR REPRESENTATIONS AS TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER MATTER. THIS SECTION SURVIVES THE EXPIRATION, TERMINATION OR CANCELLATION OF ANY AGREEMENTS BETWEEN THE PARTIES RELATING TO THE PURCHASE OF THE VALVES.

**WARRANTY LIMITATIONS:** This Warranty does not apply where the valves have been (i) subjected to abuse, misuse, damage, neglect, negligence, accident, improper testing, improper installation, improper storage, improper handling, abnormal physical stress, abnormal environmental condition, or use contrary to any instructions issued by MAC Valves, Inc.; (ii) modified, reconstructed, repaired, or altered by persons other than MAC Valves, Inc. or its authorized representative; or (iii) used with any third-party product, hardware, software or other product that has not been previously approved in writing by MAC Valves, Inc. Additionally, this Warranty does not cover claims for labor, material, time or transportation, and does not apply to loss or damage caused by fire, theft, riot, explosion, labor dispute, act of God, or other causes beyond the control of MAC Valves, Inc.

**EXCLUSIVE REMEDY:** The Buyer's sole remedy under this Warranty is limited to the replacement or rebuilding of any valve which does not conform to the warranties provided herein or, in MAC Valves, Inc.'s sole discretion, refund of the purchase price for the non-conforming valve. Buyer's remedy is conditioned on Buyer's compliance with its obligations under this Warranty. Valves that Buyer believes do not conform to this Warranty must be returned (with or without bases) transportation prepaid and received at our factory within the Warranty Period. If MAC Valves, Inc. determines that the valve is non-conforming and is otherwise covered by this Warranty, the rebuilt or replaced valve will be returned to the customer at the expense of MAC Valves, Inc., and will carry the same warranties as provided under the Flat Rate Rebuild Program described below.

MAC VALVES, INC. WILL NOT BE RESPONSIBLE FOR ANY INCIDENTAL, SPECIAL, EXEMPLARY OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION DIRECT AND INDIRECT LOST PROFITS, REGARDLESS OF WHETHER THOSE DAMAGES WERE FORSEEABLE.

#### **The Flat Rate Rebuild Program:**

Valves no longer covered by the MAC Warranty may be eligible to be rebuilt under the MAC Valves, Inc. Flat Rate Rebuild Program. Our constant research and testing program is dedicated to extending the life of our valves and maximizing their reliability under the most adverse operating conditions. Valves returned under this program are completely disassembled, inspected, rebuilt to current operating standards wherever possible, tested and returned within a few weeks for a nominal flat rate charge. All rebuilt valves carry the same warranty described above for new valves for a warranty period of 90 days from the date of shipment from our factory.

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