

## Individual mounting

inline

Series

35

100

200

55

56

57

58

**59**

45

700

900

82

6300

6500

6600

1300

800

ISO 1

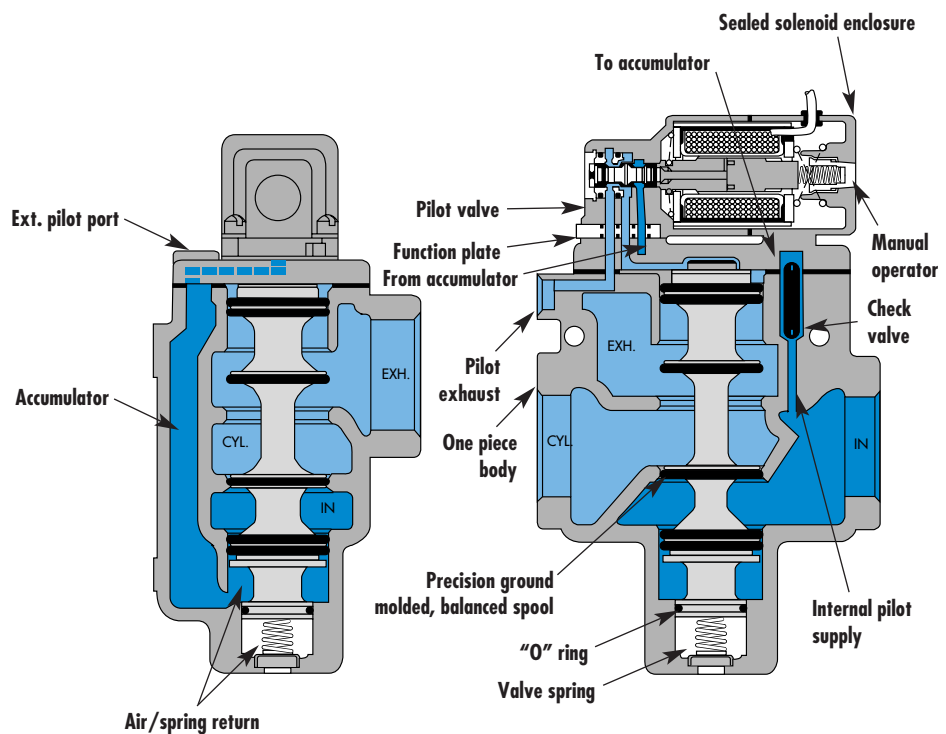
ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A



## SERIES FEATURES

- The patented MACSOLENOID® with its non-burn out feature on AC service.
- Seven valve functions in one valve.
- Balanced spool unaffected by back pressure in the exhaust.
- A large checked accumulator which supplies the pilot and air/spring return for consistent shifting.
- A triple rated coil for 120/60, 110/50 or 24 VDC (6 Watt).
- Use on lube or non-lube service.
- Various types of manual operators and solenoid enclosures.
- Optional low wattage DC coils down to 1 watt.
- Optional explosion proof models designed to meet CSA standards for Class I, Groups B, C, D and Class II, Groups E, F and G. (NEMA equivalent of Class I is NEMA 7; Class II is NEMA 9).

#### VALVE CONFIGURATIONS AVAILABLE

- 3-Way Normally Open (solenoid) or Normally Closed (solenoid or remote air).
- 2-Way (by plugging Exhaust port), Normally Open (solenoid) & Normally Closed (solenoid or remote air).
- Internal pilot or External pilot for vacuum to 25 PSI main valve pressures on solenoid models.

#### SERIES FEATURES-REMOTE AIR PILOT OPERATED VALVES

The remote air versions feature:

- A large checked accumulator for air/spring return.
- Balanced spool unaffected by back pressure in the exhaust and may be plugged for 2-way operation.
- Use on lube or non-lube service.

#### APPLICATION CONVERSION PROCEDURE

The balanced spool design and the unique N.C. and N.O. pilot valve function plate on solenoid models facilitate using the same valve for 7 different functions.

The 7 functions are as follows:

- 3-way Normally Closed-All 3 main valve ports utilized and function plate placed with "3-C" (3-way N.C.) visible.
- 3-way Normally Open-All 3 main valve ports utilized and function plate placed with "3-O" (3-way N.O.) visible.

- 2-way Normally Closed-Same as 3-way N.C. but also plug the Exhaust port.
- 2-way Normally Open-Same as 3-way N.O. but also plug the Exhaust port.
- Selector-Pipe higher pressure to the Inlet port and lower pressure to the Exhaust port.
- Internal Pilot-Utilized for main valve pressures of 25-150 PSI. Includes a check rod in the body and a 1/8" pipe plug installed in the External Pilot port.
- External Pilot-An External Pilot supply is required when main valve pressures are lower than 25 PSI. If converting from an Internal Pilot model, remove the 1/8" pipe plug from the External Pilot and remove adapter plate. Remove check rod from the body and install an 1/8" pipe plug in the check rod hole and pipe an external supply greater than 25 PSI to the External Pilot port. For vacuum service, make the vacuum connection to the Exhaust port and leave the Inlet port open to atmosphere.

#### N.C.-N.O. OPERATIONS:

##### SOLENOID MODELS:

With the pilot valve available either N.C. or N.O., simply by inverting the function plate, and using the N.C. main spool, N.C or NO main valve functions are achieved.

##### REMOTE AIR MODELS:

On remote air pilot operated models, N.O. pilot signal must be used for a N.C. main valve function.

| Function                    | Port size          | Flow [Max]                | Individual mounting | Series |
|-----------------------------|--------------------|---------------------------|---------------------|--------|
| <b>3/2 NO-NC, 2/2 NO-NC</b> | <b>2" - 2 1/2"</b> | <b>60.0 C<sub>v</sub></b> | inline              |        |

## OPERATIONAL BENEFITS

- Balanced spool, immune to variations of pressure.
- Short stroke with high flow.
- Large spool area provides maximum shifting forces.
- Checked accumulator guarantees maximum pilot pressure.
- Powerful return force thanks to the combination of mechanical and air springs.
- Bonded spool with minimum friction, shifting in a glass-like finished bore.
- Wiping effect eliminates sticking.
- Pilot valve with balanced poppet, high flow, short and consistent response times.



## HOW TO ORDER

| Port size          | Pilot air | NC only valve<br>NC pilot - NC spool | NO only valve<br>NO pilot - NC spool |
|--------------------|-----------|--------------------------------------|--------------------------------------|
|                    |           |                                      |                                      |
| <b>2" NPTF</b>     | Internal  | 59B-12- <b>XXYYZZ</b>                | 59B-22- <b>XXYYZZ</b>                |
| <b>2 1/2" NPTF</b> | Internal  | 59B-13- <b>XXYYZZ</b>                | 59B-23- <b>XXYYZZ</b>                |
| <b>2" NPTF</b>     | External  | 59B-32- <b>XXYYZZ</b>                | 59B-42- <b>XXYYZZ</b>                |
| <b>2 1/2" NPTF</b> | External  | 59B-33- <b>XXYYZZ</b>                | 59B-43- <b>XXYYZZ</b>                |

## SOLENOID OPERATOR ►

**XX Y ZZ\***

| XX        | Voltage                        | Y        | Manual operator | ZZ        | Electrical connection       |
|-----------|--------------------------------|----------|-----------------|-----------|-----------------------------|
| <b>11</b> | 120/60, 110/50, 24 VDC (6.0 W) | <b>0</b> | No operator     | <b>JA</b> | Square connector            |
| <b>12</b> | 240/60, 220/50                 | <b>1</b> | Non-locking     | <b>JC</b> | Square connector with light |
| <b>22</b> | 24/60, 24/50                   | <b>2</b> | Locking         | <b>BA</b> | Flying leads (18")          |
| <b>52</b> | 24 VDC (2.5 W)                 |          |                 | <b>CA</b> | Conduit 1/2" NPS            |
| <b>78</b> | 24 VDC (24.0 W)                |          |                 | <b>EA</b> | Hazardous location          |
| <b>61</b> | 24 VDC (8.5 W)                 |          |                 |           |                             |

\* Other options available, see page 349.

Note : Hazardous location option supplied with no manual operator ("0"). DC voltage not available below 6 Watts.

## TECHNICAL DATA

|                            |                                                                                                                             |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Fluid :                    | Compressed air, vacuum, inert gases                                                                                         |
| Pressure range :           | Internal pilot : 25 to 150 PSI<br>External pilot : vacuum to 150 PSI                                                        |
| Pilot pressure :           | 25 to 150 PSI (Not to exceed main valve pressure by more than 50 PSI)                                                       |
| Lubrication :              | Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)                                     |
| Filtration :               | 40 µ                                                                                                                        |
| Temperature range :        | 0°F to 120°F (-18°C to 50°C)                                                                                                |
| Flow (at 6 bar, ΔP=1bar) : | 2" (55.0 C <sub>v</sub> ), 2 1/2" C <sub>v</sub> (60.0 C <sub>v</sub> )                                                     |
| Coil :                     | General purpose class A, continuous duty, encapsulated                                                                      |
| Voltage range :            | -15% to +10% of nominal voltage                                                                                             |
| Protection :               | Consult factory                                                                                                             |
| Power :                    | ~ Inrush : 33 VA      Holding : 19.7 VA<br>= 1 to 24 W                                                                      |
| Response times :           | 24 VDC (8.5 W)      Energize : 38 ms      De-energize : 25ms<br>120/60      Energize : 35-45 ms      De-energize : 25-34 ms |

## Spare parts :

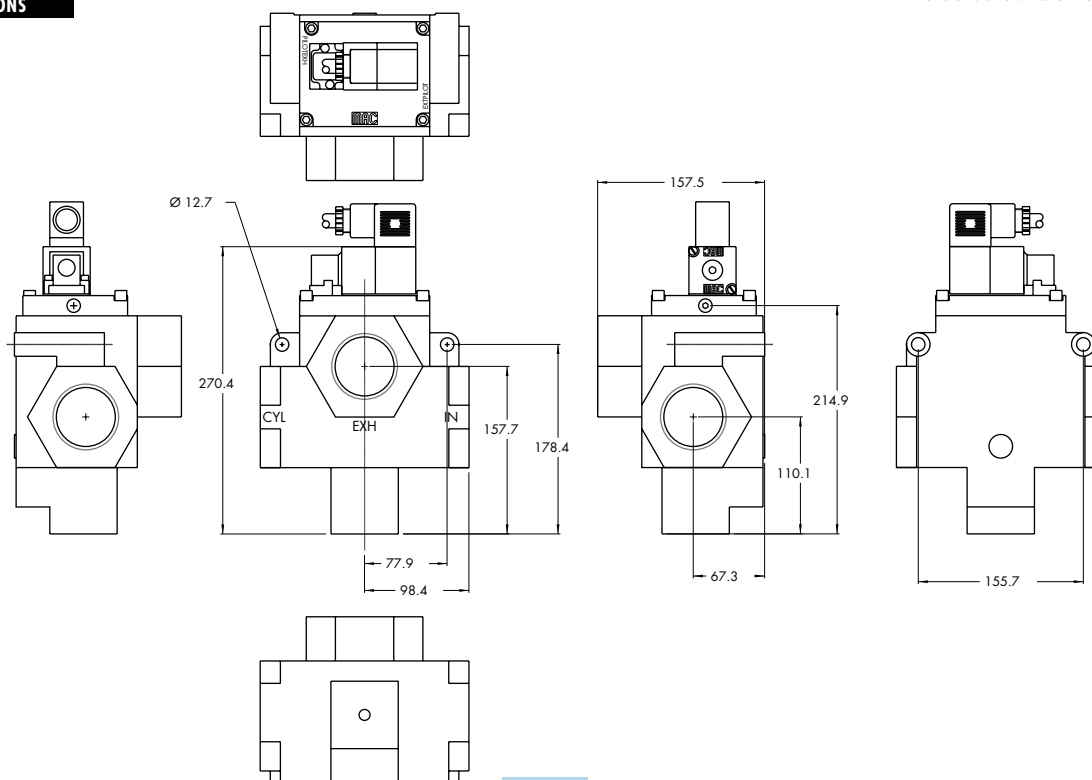
- Solenoid operator (power ≥ 6 W) : D4-XXAAB, cover mounting screws 32222 and seal B5-6001.
- Pilot valve : 250B-XXYZZ, including mounting screws 32203 and function plate A2-7005. • Check valve : 70019.

## Options :

- BSPP threads.

## DIMENSIONS

Dimensions shown are metric (mm)



## Codification table for voltages / Manual operator / Electrical connection / Wire length

VALVE CODE ➤ **-XX Y ZZ (-VV)**  
**1 2 3 4**

| OPTIONS AVAILABLE FOR                                                                                                                                                                                                                                           | OPTIONS AVAILABLE FOR                                                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>- valves type 100 Series</li> <li>- pilot valves "CNOMO"</li> </ul>                                                                                                                                                      | <ul style="list-style-type: none"> <li>- valves type 200 Series</li> </ul>                                                                  |
| <ul style="list-style-type: none"> <li>- Pilot operated valves with pilots type 100 Series</li> <li>Series : 55 - 56 - 700 - 800 - 900</li> <li>- 6300 - 6500 - 6600 - 1300</li> <li>- ISO 1 - ISO 2 - ISO 3.</li> <li>- MAC 125 - MAC 250 - MAC 500</li> </ul> | <ul style="list-style-type: none"> <li>- pilot operated valves with pilots type 200 Series</li> <li>Series : 200 - 57 - 58 - 59.</li> </ul> |
| <ul style="list-style-type: none"> <li>- Pilot operated valves with pilots "CNOMO"</li> <li>Series : ISO1 - ISO2 - ISO3</li> </ul>                                                                                                                              |                                                                                                                                             |

Used on valve series: 100, 55, 56, 700, 800, 900, 6300, 6500, 6600, 1300, MVA1C, MVA2B, MVA3B, MAC125, MAC250, MAC500.

### 1. VOLTAGE (100 Serie type coil)

| - XX Y ZZ | VOLTAGE                           |
|-----------|-----------------------------------|
| 11        | 120/60, 110/50                    |
| 12        | 240/60, 220/50                    |
| 13        | 100/60, 100/50                    |
| 15        | 200/60, 200 /50                   |
| 16        | 10/60                             |
| 20        | 6/60                              |
| 21        | 12/50, 12/60                      |
| 22        | 24/60, 24/50                      |
| 23        | 32/60, 32/50                      |
| 24        | 48/60, 42/50                      |
| 26*       | 380/50, 440/50, 440/60, 480/60    |
| 29        | 220/60                            |
| 34        | 127/50, 120/50                    |
| 35        | 48/50                             |
| 36        | 16/60                             |
| B1        | 24/50                             |
| 50        | 24 VDC (6 W)                      |
| 51        | 24 VDC (4 W)                      |
| 54        | 12 VDC (4 W)                      |
| 55        | 12 VDC (6 W)                      |
| 57        | 12 VDC (2.5 W)                    |
| 59        | 24 VDC (2.5 W)                    |
| 60        | 12 VDC (8.5 W)                    |
| 61        | 24 VDC (8.5 W)                    |
| 64        | 6 VDC (6 W)                       |
| 65        | 32 VDC (7 W)                      |
| 66        | 48 VDC (5.8 W)                    |
| 67        | 64 VDC (7.5 W)                    |
| 68        | 120 VDC (6.4 W)                   |
| 69*       | 220 VDC (8.7 W), 250 VDC (11.2 W) |
| 75        | 90 VDC (8.8 W)                    |
| 76*       | 100 VDC (6.9 W)                   |
| 84*       | 125 VDC (10.9 W)                  |
| 87*       | 24 VDC (17.1 W)                   |
| 88*       | 12 VDC (17.4 W)                   |
| 89*       | 36 VDC (18.8 W)                   |
| 90        | 28 VDC (8.2 W)                    |
| 91*       | 6 VDC (10.6 W)                    |
| 92        | 190 VDC (6.5 W)                   |
| 94        | 3 VDC (7 W)                       |
| 95        | 38 VDC (6.4 W)                    |
| A1        | 24 VDC (1 W)                      |
| A2        | 12 VDC (1 W)                      |
| A3        | 9 VDC (1 W)                       |

MOD. DD01 : Protection diode (DC) - MAX. 8.5W

MOD. MOV1 : Protection varistor (AC) - MAX. 8.5W

\* Voltages are CLSF only

Used on valve series: 200, 57, 58, 59.

### 1. VOLTAGE (200 Serie type coil)

| - XX Y ZZ | VOLTAGE                          |
|-----------|----------------------------------|
| 11        | 120/60, 110/50, 24 VDC (6 W)     |
| 12        | 240/60, 220/50                   |
| 13        | 100/60, 100/50                   |
| 14        | 200/60, 200/50                   |
| 20        | 6/60                             |
| 21        | 12/60                            |
| 22        | 24/60, 24/50                     |
| 23        | 32/60, 32/50                     |
| 24        | 48/60, 42/50                     |
| 25        | 240/50                           |
| 26        | 480/60, 440/50                   |
| 27        | 127/60                           |
| 28        | 415/50                           |
| 29        | 220/60                           |
| 30        | 380/50                           |
| 31        | 550/60, 550/50                   |
| 32        | 120/60, 110/50                   |
| 33        | 600/60                           |
| 34        | 127/50                           |
| 35        | 48/50                            |
| 50        | 24 VDC (6 W)                     |
| 51        | 24 VDC (4.5 W)                   |
| 52        | 24 VDC (2.5 W)                   |
| 53        | 24 VDC (1.0 W)                   |
| 55        | 12 VDC (6 W)                     |
| 57        | 12 VDC (2.5 W)                   |
| 58        | 48 VDC (2.5 W)                   |
| 60        | 12 VDC (9.5 W)                   |
| 61        | 24 VDC (8.5 W)                   |
| 64        | 6 VDC (8.5 W)                    |
| 65        | 32 VDC (10 W)                    |
| 66        | 48 VDC (11.5 W)                  |
| 67        | 64 VDC (10.5 W)                  |
| 68        | 120 VDC (12.3 W)                 |
| 69        | 250 VDC (9.2 W)                  |
| 71        | 8 VDC (8.2 W)                    |
| 72        | 24 VDC (12 W)                    |
| 73        | 198 VDC (10 W)                   |
| 74        | 72 VDC (11.3 W)                  |
| 75        | 90 VDC (11.3 W)                  |
| 76        | 100 VDC (9 W)                    |
| 77        | 220 VDC (10 W), 230 VDC (11.6 W) |
| 78*       | 24 VDC (24 W)                    |
| 80        | 55 VDC (10.6 W)                  |
| 82        | 170 VDC (11.1 W)                 |
| 83        | 15 VDC (8.1 W)                   |
| 84        | 125 VDC (10 W)                   |
| 86        | 36 VDC (11 W)                    |
| 93*       | 12 VDC (24 W)                    |

## 2. MANUAL OPERATOR (Common options for 100 & 200 Series type coils)

| - XX Y ZZ | MANUAL OPERATOR      |    |                                 |
|-----------|----------------------|----|---------------------------------|
| 0         | No operator          | 5* | No Operator with Light          |
| 1         | Non-locking recessed | 6* | Non-Locking Recessed with Light |
| 2         | Locking recessed     | 7* | Locking Recessed with Light     |
| 3         | Non-locking extended | 8* | Non-Locking Extended with Light |
| 4         | Locking extended     | 9* | Locking Extended with Light     |

\* Lights used with "AA" electrical connection

### 3. ELECTRICAL CONNECTION (100 Serie type coil)

| - XX Y ZZ | ELECTRICAL CONNECTION                                         |
|-----------|---------------------------------------------------------------|
| AA        | Wiring box with 1/2" NPS conduit                              |
| BA        | Flying leads                                                  |
| CA        | 1/2" NPS conduit                                              |
| CC        | 1/2" NPT conduit                                              |
| FA        | Military type 2 PIN                                           |
| GA        | Military type 3 PIN                                           |
| HA        | AA with ground wire                                           |
| JA*       | Square connector                                              |
| JB        | Rectangular connector                                         |
| JC*       | Square connector with light                                   |
| JD        | Rectangular connector with light                              |
| JE        | Square connector on top<br>(ISO2, ISO3)                       |
| JF        | Rectangular connector on top<br>(ISO1, ISO2, ISO3)            |
| JG        | JE with light                                                 |
| JH        | JF with light                                                 |
| JJ        | Square connector, male only                                   |
| JM        | Rectangular connector, male only                              |
| MA        | Electrical common conduit<br>(100 Series-Manifold/900 Series) |
| MB        | Electrical common conduit<br>(100 Series-Stacking/700 Series) |
| NA        | CA with ground wire                                           |
| NC        | CC with ground wire                                           |
| RA        | 3/8" NPS conduit                                              |

\* Not to be used with 100, 800 and 900 Series manifold mounting

### 3. ELECTRICAL CONNECTION (200 Serie type coil)

| - XX Y ZZ | ELECTRICAL CONNECTION                |
|-----------|--------------------------------------|
| AA        | Wiring box with 1/2" NPS conduit     |
| BA        | Flying leads                         |
| CA        | 1/2" NPS conduit                     |
| CC        | 1/2" NPT conduit                     |
| EA        | Explosion proof (200 Series)         |
| EA        | Explosion proof (57, 58 & 59 Series) |
| FA        | Military type 2 PIN                  |
| GA        | Military type 3 PIN                  |
| HA        | AA with ground wire                  |
| JA*       | Square connector                     |
| JC        | Square connector with light          |
| JJ        | Square connector, male only          |
| NA        | CA with ground wire                  |
| NC        | CC with ground wire                  |

#### 4. COIL WIRE LENGTH (Common options for 100 & 200 Serie type coils)

| - XX Y ZZ (-VV)                          | WIRE LENGTH |
|------------------------------------------|-------------|
| <b>AA</b>                                | 18"         |
| <b>AB</b>                                | 24"         |
| <b>AD</b>                                | 36"         |
| <b>AE</b>                                | 48"         |
| <b>AF</b>                                | 72"         |
| <b>AG</b>                                | 6"          |
| <b>AR</b>                                | 12"         |
| <b>AU</b>                                | 120"        |
| <b>BA</b>                                | 60"         |
| <b>BB</b>                                | 144"        |
| Series 6000 : wire length, from the base |             |
| <b>MOD L024</b>                          | 24"         |
| <b>MOD L036</b>                          | 36"         |
| <b>MOD L048</b>                          | 48"         |
| <b>MOD L060</b>                          | 60"         |
| <b>MOD L072</b>                          | 72"         |
| <b>MOD L120</b>                          | 120"        |