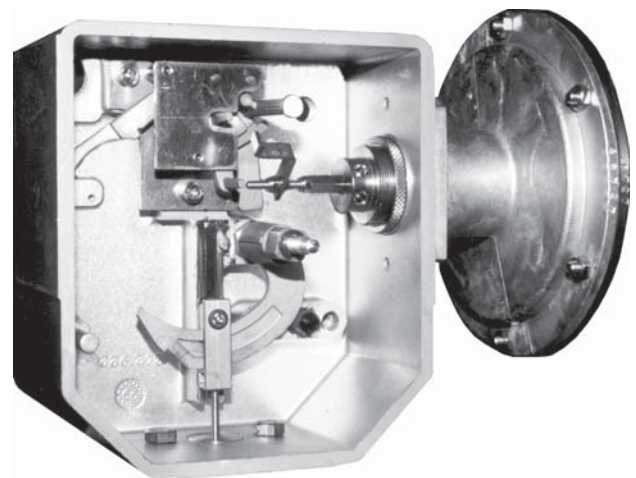


March 2006

# RELEASE RELAY

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Type OS2

## INTRODUCTION

The OS2 NACE Release Relay consists of a **Mechanism Box (BM)** and one or two **Safety Manometric Boxes (BMS)**. It's function is to provoke the activation of a slam shut valve which may be **stand alone** (OSB, OSE), **integrated** in a regulator (MP, MPS, Pilot DRPN, ASONEX D, C MAX, DRPN, EZR..) or

**integrated** in a K1000/K3000, in the case of under or over pressure in the controlled gas network. It may be mounted on systems of DN 25 to DN 150 and up to PN 100. It is **tight shut** and **submersible**. It may be connected to an explosion-proof contact (intrinsically safe).

Europe, Middle East, and Africa Document Only

## MECHANISM BOX (BM)

The mechanism box is designed to close a slam shut valve. The operation is ensured in two successive stages: a detection stage and a power stage. **The separation between the detection stage and the power stage provides maximum precision, indifferent of working pressure, slam shut valve diameter and gas flow.** After activation of the slam shut valve due to over or under pressure, the mechanism box must be reset manually. The complete system is available, on request only, sealed with lead and wire.

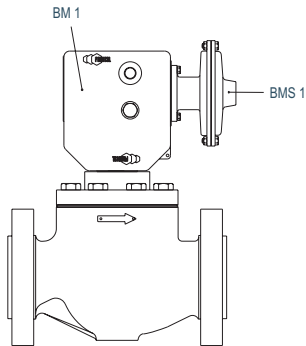
## SAFETY MANOMETRIC BOX (BMS)

The pressure data is transformed into a displacement by a safety manometric box (**BMS 1**) mounted on the mechanism box (**BM**). This displacement is used to activate the detection stage of the mechanism box in the case of **overpressure, over or underpressure, or underpressure condition.** In certain configurations, a second box may be used (**BMS 2**).

## TYPES OF INSTALLATION

Mounting on horizontal pipeline only:

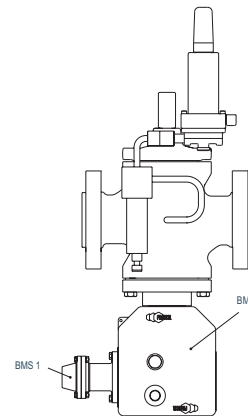
Top mounted (stand-alone valve)



N01

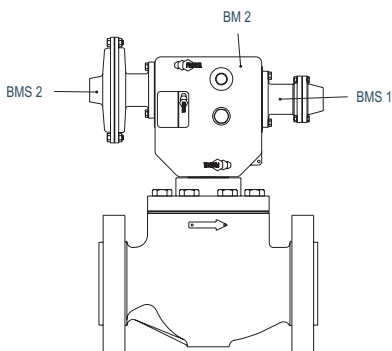
1 - BM 1: Mechanism Box with 1 safety manometric box (BMS 1)

Bottom mounted (integrated valve and regulator)



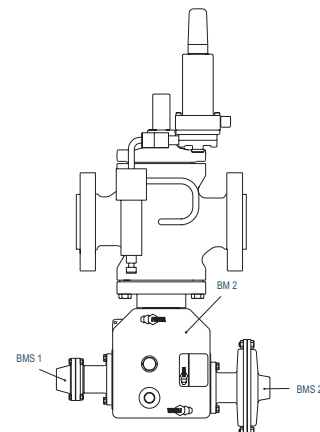
N03

3 - BM 1: Mechanism Box with 1 safety manometric box (BMS 1)



N02

2 - BM 2: Mechanism Box with 2 safety manometric boxes (BMS 1, BMS 2)



N04

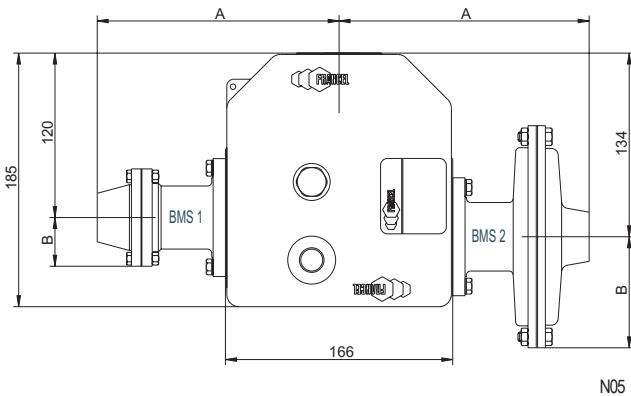
4 - BM 2: Mechanism Box with 2 safety manometric boxes (BMS 1, BMS 2)

# OS2 NACE

## CHARACTERISTICS

|                                      |                |                 |                         |
|--------------------------------------|----------------|-----------------|-------------------------|
| <b>Accuracy</b>                      |                | AG 2.5          | Diaphragm or bellows    |
|                                      |                | AG 5            | Piston                  |
| <b>Memorization</b>                  |                | No memorization |                         |
| <b>Resistance to vertical shocks</b> |                | 4 J             | (20 shocks)             |
| <b>Resistance to pendular shocks</b> |                | 9.81 J          | (20 shocks)             |
| <b>Sealing</b>                       |                | IP 68           | 72 h under 2 m of water |
| <b>Max. pressure</b>                 | <b>Inlet</b>   | 100             | bar                     |
|                                      | <b>Impulse</b> | 100             | bar                     |
| <b>Ambient temperature</b>           |                | - 30° to + 71°  | C                       |
| <b>Max. valve travel</b>             |                | 50              | mm                      |

## DIMENSIONS AND WEIGHTS



5 - Sizes

|            | Type            | DIMENSIONS (mm) |    | WEIGHTS (kg) |
|------------|-----------------|-----------------|----|--------------|
|            |                 | A               | B  |              |
| <b>BM</b>  | BM 1 for 1 BMS  |                 |    | 2.5          |
|            | BM 2 for 2 BMS  |                 |    | 2.5          |
| <b>BMS</b> | 162 Diaphragm   | 181             | 83 | 2.6          |
|            | 71 Diaphragm    | 175             | 36 | 1.2          |
|            | 27 or 17 Piston | 204             | 36 | 2.3          |
|            | 236 Bellows     | 202             | 36 | 2.4          |
|            | 315 Bellows     | 223             | 36 | 2.8          |

For an OS2 with one BMS add the weight of the BMS to that of the BM 1.  
For an OS2 with two BMS add the weight of the two BMS to that of the BM 2.

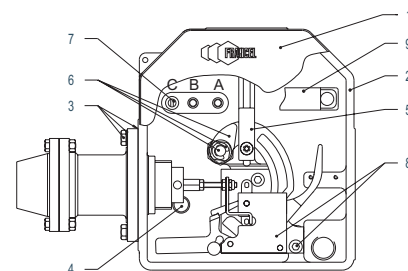
## DESCRIPTION AND SPARE PARTS (BM)

### Mechanism box assembly

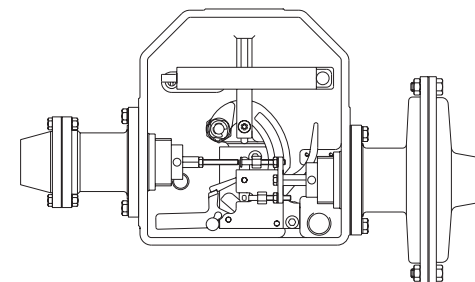
| Item | Description                             | BM 1           | BM 2   |
|------|---|----------------|--------|
|      | Mechanism box                           | 181067         | 181068 |
| 1    | Cap assembly (indicator, O-ring, screw) | 181061         |        |
| 2    | Mechanism box casing                    | 142924         | 144071 |
| 3    | Box gasket                              | <b>142930*</b> |        |
|      | BMS gasket                              | <b>142931*</b> |        |
|      | BMS screw                               | 402018*        |        |
|      | BMS sealing screw o-rings               | <b>461150*</b> |        |
| 4    | Non-connectable brace vent              | 27A5516X012    |        |
|      | Vent link for 8x10 tube                 | 406526         |        |
| 5    | Yoke                                    | 181042         |        |
| 6    | Fixed bolt axe (do not dismount)        | 142920         |        |
|      | Bolt                                    | 181043         |        |
|      | Truarco-ring                            | 406128         |        |
| 7    | Travel stop                             | 140324         |        |
|      | Damper                                  | 127692         |        |
| 8    | Mechanism                               | 181041         |        |
|      | Mechanism screw                         | 402512         |        |
| 9    | Resetting tool                          | 242915         |        |

\* Sold as a set ref. n° 197351.

Items in bold are spare parts



6a - Mecanism box for 1 BMS



6b - Mecanism box for 2 BMS

## CONNECTIONS

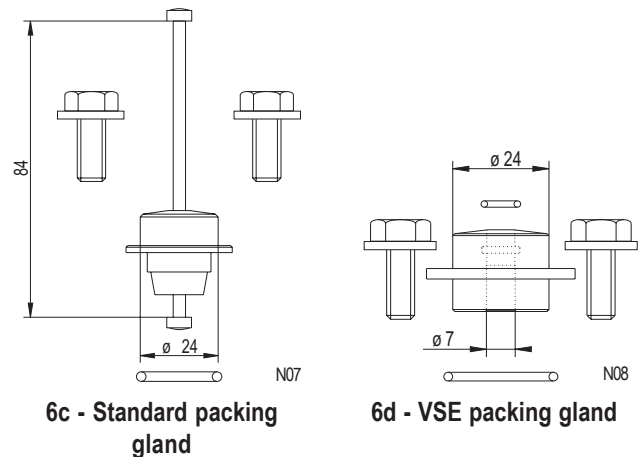
|                 |                          |          |
|-----------------|--------------------------|----------|
| Non connectable | Plastic vent with screen | 1/4" NPT |
| Connectable     | Link for 8/10 tube       |          |
| Contact         | Box exit                 | 1/2" NPT |

## DESCRIPTION AND SPARE PARTS (BM)

### Packing gland assembly

| Description            | Packing gland  |                |                |
|------------------------|----------------|----------------|----------------|
|                        | Valve          |                |                |
|                        | OSB            | VSE            | Standard       |
| Assembly               | <b>181 089</b> | <b>181 090</b> | <b>181 104</b> |
| Packing gland and stem | 181 040        |                | 181 040        |
| Packing gland          |                | 144 126        |                |
| O-ring                 | 400 514        | 400 505        | 400 514        |
| O-ring                 |                | 400 221        |                |
| Fastening screw H M7   | 402 028        |                | 402 028        |
| Fastening screw H M8   |                | 402 036        | 402 036        |
| Flat washer (7)        | 405 005        |                | 405 005        |
| Flat washer (8)        |                | 405 006        | 405 006        |

Items in bold are spare parts



6c - Standard packing gland

6d - VSE packing gland

## OPERATION (BM)

The detection stage consists of two parts:

- the releasing stem (1),
- the 1<sup>st</sup> stage trigger (2).

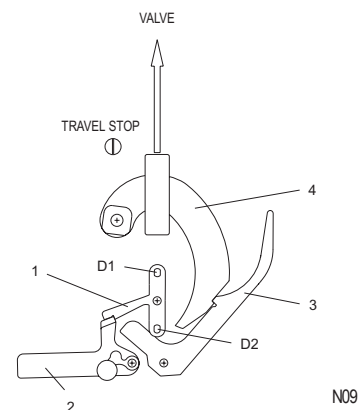
Through the intermediate of the safety manometric box (BMS), the pressure provokes a pin movement (D1 or D2), which provokes the rotation of the releasing stem (1) and frees the 1<sup>st</sup> stage trigger (2).

The power stage consists of two parts:

- the 2<sup>nd</sup> stage trigger (3),
- the cam (4).

The 2<sup>nd</sup> stage trigger (3), activated by the 1<sup>st</sup> stage trigger (2), frees the cam (4), which provokes the valve to close.

After release, the **resetting** is ensured in two stages: (detection stage, then power stage) see "commissioning".



7 - Mechanism

### Position indicator

The position of the detection stage can be seen through the position indicator glass.

### Memorization

The releasing stem will only start moving when pressure approaches the pressure set point. In all other cases, it remains fixed. Furthermore the assembly has a very high resistance to shocks. If pressure approaches the set point, the releasing stem turns, but with the slightest shock or vibration it will go back to its initial position and pressure returns to normal. The mechanism is said to be non memorizing.

### Resistance to shocks

This assembly has a remarkable resistance to shocks (20 vertical shocks of 4 J and 20 pendular shocks of 9.81 J), with pressure close to set point (for example: 186 mbar for a set point of 200 mbar).

## CONNECTIONS (BM)

- Fixation BM / Connector:  
H M7 or H M8 screws  
16 N.m torque
- Sealed BM / Connector:  
Flat O-ring (water resistant)  
Packing gland (gas resistant)
- Mechanism contact / Slam shut valve:  
Control rod
- BM connector / atmosphere:  
Integrated vent nipple with screen (supplied) or compression fitting (supplied) for 8/10 tube (not supplied)\*
- Electrical connection:  
See page 6

\* The 8/10 tube should be angle-shaped on the top to avoid water from entering.

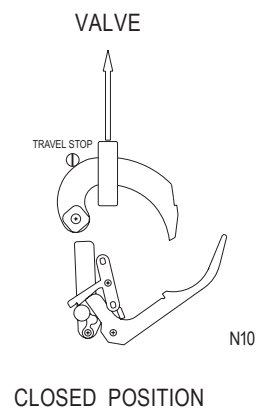
## MECHANISM BOX (BM) MATERIAL

**Mechanism Box (BM)**

|                  |                    |                 |               |
|------------------|--------------------|-----------------|---------------|
| <b>Box</b>       | Body               | Aluminium       | Chromatation  |
|                  | Cover              | Aluminium       | Chromatation  |
|                  | Position indicator | Polycarbonate   |               |
|                  | Self-jamming ring  | Steel           | Phosphatation |
|                  | Cover nut          | Stainless steel |               |
|                  | Circlips           | Steel           | Phosphatation |
| <b>Mechanism</b> | All parts          | Stainless HR    |               |
|                  | Brackets           | Brass           |               |
|                  | Bolt               | Brass           |               |
|                  | Elastic O-ring     | Steel           | Phosphatation |
|                  | Torsion spring     | Stainless steel |               |
|                  | Traction spring    | Bronze          |               |
| <b>Yoke</b>      | Self-jamming ring  | Steel           | Phosphatation |
| <b>O-rings</b>   | Flat               | EPDM            |               |
|                  | Cover              | Neoprene        |               |
|                  | Truarcring         | Nitrile         |               |

**Packing gland**

|             |                 |                  |
|-------------|-----------------|------------------|
| Body        | Bronze          |                  |
| Control rod | Stainless steel | Chromium plating |
| Truarcring  | Nitrile         |                  |



## COMMISSIONING (BM)

Commissioning differs depending on whether the assembly has an **internal** or **external** bypass and whether **overpressure** releasing is required or not. See corresponding technical manuals for further details.

*Note: The position of the travel stop (item. 7 drawing 6a) depends on the type of assembly and it's size. Position A, B or C depending on max. travel of slam shut valve: A = 15 mm travel, B = 35 mm travel, C = 50 mm travel.*

### • Mechanism box (BM) intervention

To access the box the cover must be removed. When unscrewing the nut a circlips is used to remove the O-ring. The cover is held on by one screw which can be unscrewed manually or using a socket screw key (**max. recommended couple 2.5 N.m**).

### • Resetting

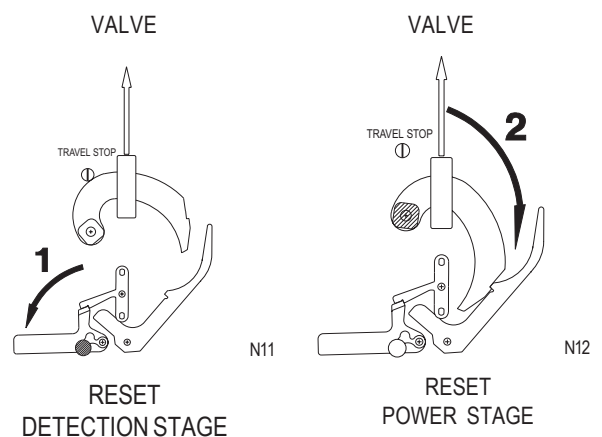
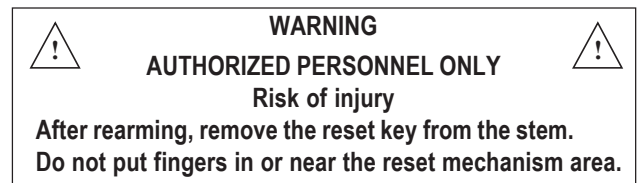
To reset the slam shut (after the fault has been settled), the 1<sup>st</sup> mechanism stage must be reset by manually turning the 1<sup>st</sup> stage trigger. If the slam shut has an internal bypass the cam must be slightly turned using a resetting key to bypass. If the slam shut has an external bypass, a bypass valve will be used.

In both cases:

**Wait for the pressure to be equalized** before resetting the 2<sup>nd</sup> mechanism stage.

When resetting the 2<sup>nd</sup> mechanism stage (opening of the valve) a reset key is used (delate).

**Never use an extension pipe with the reset key** when resetting the 2<sup>nd</sup> stage (max. normal couple 16 N.m, **never go over 32 N.m**).



**8a – Release activation stages**

## MAINTENANCE (BM)

### Tools :

- Spanner 11 (screw 7) and 13 (or 14) (screw 8)
- Screwdriver

### • Control

- 1<sup>st</sup> and 2<sup>nd</sup> stage mechanism releasing
- Packing gland is tight shut
- Yoke greasing

### • Disassembly

- Check that assembly is not under pressure
- Manual release of slam shut (drawing n° 7)

- Manually press on the releasing stem pin D1 or D2 (drawing 7, item 1) **parallel to the BMS axe**
- Unscrew the travel stop (screwdriver)
- Unscrew the BM fastening screws (flat spanner 11 (screw 7) and 13 (or 14) (screw 8))
- Disassemble the mechanism box (BM) from the connector by unlocking the yoke

### • Assembly

- Proceed in reverse order to disassembly

## OPTIONS (BM)

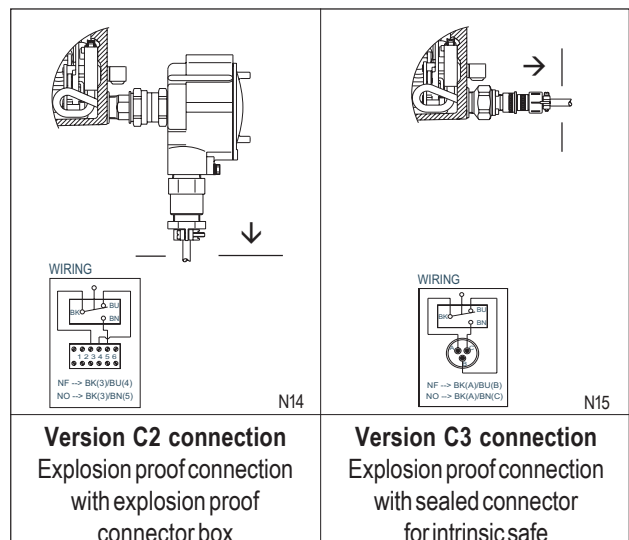
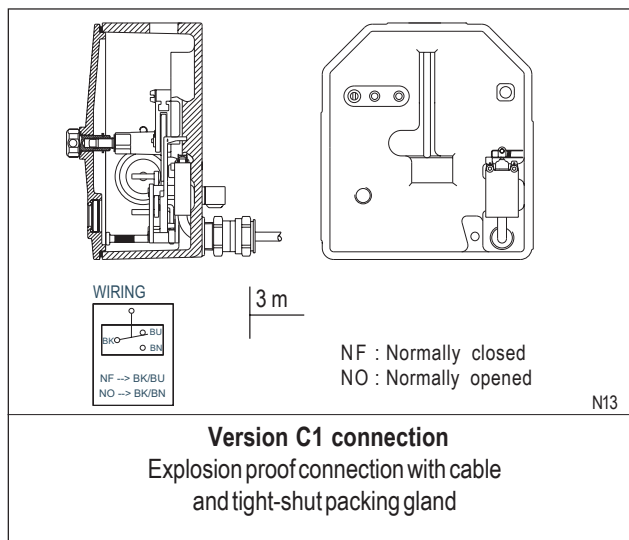
- **Remote alert** (on BM 1 or BM 2)  
Detects 2<sup>nd</sup> stage releasing (power)
- **Remote control**  
Atmospheric solenoid valve (releasing by min. pressure) for max. releasing pressure of 30 bar. Safety manometric box (BMS) activated with a pneumatic or electro-pneumatic impulse.
- **Manual control on BM 2 with 1 BMS 1 only**  
Push button (connected at the same place as a BMS 2).

### Contact

|                       | AC   | DC    |
|-----------------------|--|-------|
| <b>Max. intensity</b> | 7.0 A  | 0.8 A |
| <b>Max. tension</b>   | 400 V  | 250 V |
| <b>Protection</b>     | EEx-d IIC T6   |       |
| <b>Tightness</b>      | IP 66  |       |
| <b>Temperature</b>    | - 29°C + 71°C  |       |
| <b>Fastening</b>      | 2 M3 screws  |       |
| <b>Cable</b>          | 3 wires (black, brown, blue) H05VVF (3 x 0.75 mm <sup>2</sup> ) D 6.5 mm |       |

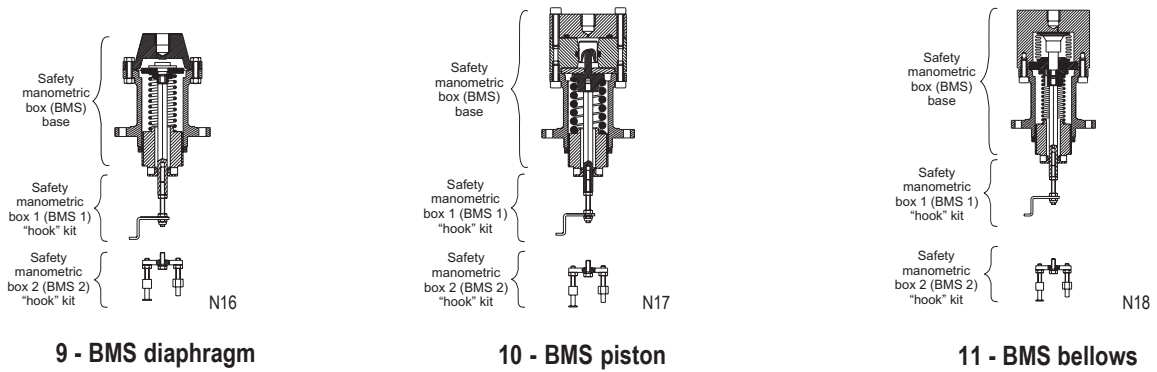
### Versions

| Versions | Installation     | Sealing | Connection      | Mechanical connections                           | Electrical connections |      |       |                |
|----------|------------------|---------|-----------------|--|------------------------|------|-------|----------------|
|          |                  |         |                 |  | Common                 | NF   | NO    | Connection     |
| C0       |                  | IP 68   | Without         | 1/2 NPT cap                                      |                        |      |       |                |
| C1       | Explosion proof  | IP 68   | Explosion proof | 3 m wire   | Black                  | Blue | Brown | Wires          |
| C2       |                  | IP 65   |                 | Explosion proof connector box/PE explosion proof | 3                      | 4    | 5     | Screwed wiring |
| C3       | Intrinsical safe | IP 68   |                 | Intrinsical safe tight-shut connector            | A                      | B    | C     | Welded wiring  |



8b - Different versions of BM OS2 connections

## SAFETY MANOMETRIC BOX (BMS) DESCRIPTION AND SPARE PARTS



| Description        |                | Diaphragm (Max. and/or Min.) |               | Piston (Max. or Min.) |                                |               | Bellows (Max. and/or Min.) |        |
|--------------------|----------------|------------------------------|---------------|-----------------------|--------------------------------|---------------|----------------------------|--------|
|                    |                | 162                          | 71            | 27                    | 27 NACE*                       | 17            | 236                        | 315    |
| <b>BMS 1</b>       | Complete box   | 181071                       | 181072        | 180999                | 181323                         | 180998        | 181073                     | 181074 |
|                    | Base           | 181105                       | 181106        | 181107                | 181322                         | 181108        | 181109                     | 181110 |
|                    | Hook kit       | 181111                       |               |                       |                                |               |                            |        |
| <b>BMS 2</b>       | Complete box   | 181084                       | 181085        | 181070                |                                | 181069        | 181086                     | 181087 |
|                    | Base           | 181105                       | 181106        | 181107                |                                | 181108        | 181109                     | 181110 |
|                    | Hook kit       | 181112                       |               |                       |                                | 181112        |                            |        |
| <b>Spare parts</b> | Diaphragm      | <b>137906</b>                | <b>142549</b> |                       |                                |               |                            |        |
|                    | Set of O-rings |                              |               | <b>197352</b>         | <b>400115</b><br><b>400116</b> | <b>197352</b> |                            |        |

\* Execution in conformity with the NACE standard MR0175 - 2001

Items in bold are spare parts

## DESCRIPTION (BMS)

### • Impulse line

The impulse line (IS) is connected to the network to be protected (normally downstream of the regulator).

### • Impulse type

Depending on the pressure and precision required, different types of impulse may be used: Diaphragm, Piston or Bellows.

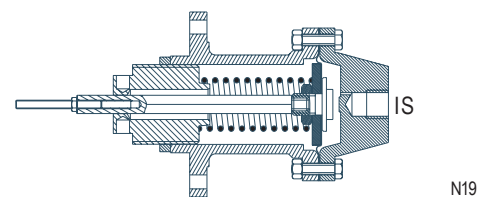
### • Springs

To cover all pressure ranges, a set of springs of equal length and diameter, but of different wire diameter (2 to 6.5 mm), may be used.

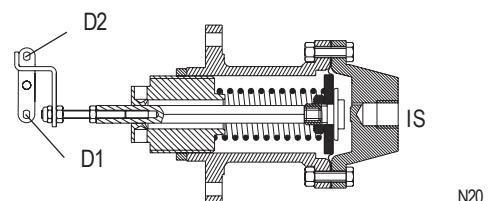
### • Detection

Possible configurations.

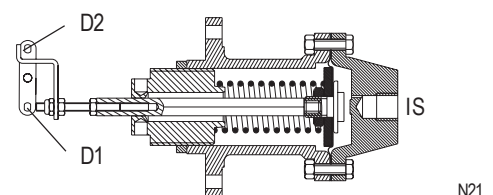
|          |              | Action by       | Max. only | Min. only | Max. & Min. |
|----------|--------------|-----------------|-----------|-----------|-------------|
| <b>1</b> | <b>BMS 1</b> | Releasing screw | Active    | Neutral   | Active      |
|          |              | Hook            | Neutral   | Active    | Active      |
| <b>2</b> | <b>BMS 1</b> | Releasing screw | Active    |           |             |
|          |              | Hook            | Neutral   |           |             |
|          | <b>BMS 2</b> | Pushbutton      | Active    | Neutral   | Active      |
|          |              | Hook            | Neutral   | Active    | Active      |



12a - BMS 1 max. only



12b - BMS 1 min. only



12c - BMS 1 max.-min.

# OS2 NACE

## OPERATION (BMS)

The pressure of the network to be protected pushes the diaphragm, piston or bellows.  
The force resulting from this opposes the force (adjustable)

coming from the set-point spring.  
When pressure varies, the detection rod moves and provokes releasing by max. or min. pressure.

### Releasing by max. pressure

| Pressure    | BMS 1  | BMS 2                  |
|-------------|--|------------------------|
|             | Releasing screw  | Push button            |
| Normal      | Without D1 pin contact                                       | Without D2 pin contact |
| Increase    | With D1 pin contact  | With D2 pin contact    |
| = Set point | Rotation of releasing stem and 1 <sup>st</sup> stage trigger |                        |

### Releasing by min. pressure

| Pressure    | BMS 1  | BMS 2                  |
|-------------|--|------------------------|
|             | Hook   | Hook                   |
| Normal      | Without D2 pin contact                                       | Without D1 pin contact |
| Decrease    | With D2 pin contact  | With D1 pin contact    |
| = Set point | Rotation of releasing stem and 1 <sup>st</sup> stage trigger |                        |

## CONNECTIONS (BMS)

On the mechanism box : 2 H M6x16 screws (code 402018)  
BM sealing : Flat O-ring and tight shut O-rings  
On the manometric box : 1/4" NPT screwed

Recommended tube: 8/10 mm  
The sensing line must be connected downstream of the regulator.

## SPRING ADJUSTMENT RANGES (BMS)

(see definitions page 10)

|                  | BMS       |      |               | SPRING      |         | MAX. ONLY             |                   |               | INTERVALS |
|------------------|-----------|------|---------------|-------------|---------|-----------------------|-------------------|---------------|-----------|
|                  | Type      | Size | PMS box (bar) | Ø wire (mm) | Code    | P setting (bar)       |                   |               | Δ1        |
|                  |           |      |               |             |         | Max. low pt. possible | Recommended range |               | Δ1 (bar)  |
|                  |           |      |               |             |         |                       | Max. low pt.      | Max. high pt. |           |
| <b>MAX. ONLY</b> | Diaphragm | 162  | 10            | 2.0         | 113 195 | 0.010                 | 0.015             | 0.035         | 0.004     |
|                  |           |      |               | 2.5         | 113 196 | 0.025                 | 0.040             | 0.080         | 0.005     |
|                  |           |      |               | 3.0         | 113 197 | 0.045                 | 0.080             | 0.140         | 0.010     |
|                  |           |      |               | 3.5         | 113 198 | 0.070                 | 0.070             | 0.240         | 0.014     |
|                  |           |      |               | 4.0         | 113 199 | 0.115                 | 0.140             | 0.380         | 0.018     |
|                  |           |      |               | 5.0         | 113 201 | 0.140                 | 0.300             | 0.750         | 0.050     |
|                  |           |      |               | 5.5         | 113 202 | 0.250                 | 0.600             | 1.3           | 0.080     |
|                  | 071       | 20   | 4.5           | 113 200     | 1.0     | 2.0                   | 5.1               | 0.350         |           |
|                  |           |      | 5.5           | 113 202     | 2.1     | 4.0                   | 11.0              | 0.700         |           |
|                  |           |      | 6.5           | 114 139     | 4.0     | 8.0                   | 16.0              | 1.6           |           |
|                  | Piston    | 027  | 100           | 5.5         | 113 202 | 16.0                  | 16.0              | 22.0          | 3.0       |
|                  |           |      |               | 6.5         | 114 139 | 22.0                  | 22.0              | 40.0          | 6.5       |
|                  |           | 017  | 100           | 5.5         | 113 202 | 40.0                  | 40.0              | 55.0          | 7.0       |
|                  |           |      |               | 6.5         | 114 139 | 55.0                  | 55.0              | 100.0         | 12.0      |
| Bellows          | 236       | 35   | 5.5           | 113 202     | 5.5     | 11.0                  | 22.0              | 1.6           |           |
|                  |           |      | 6.5           | 114 139     | 8.3     | 16.0                  | 35.0              | 2.5           |           |
|                  | 315       | 72   | 5.0           | 113 201     | 17.5    | 35.0                  | 72.0              | 5.0           |           |

# OS2 NACE

## SPRING ADJUSTMENT RANGES (BMS) (continued)

| <b>MIN. ONLY</b> | BMS    |      |               | SPRING      |        | MIN. ONLY             |                   |               | INTERVALS |
|------------------|--------|------|---------------|-------------|--------|-----------------------|-------------------|---------------|-----------|
|                  | Type   | Size | PMS box (bar) | Ø wire (mm) | Code   | P setting (bar)       |                   |               | Δ1        |
|                  |        |      |               |             |        | Min. low pt. possible | Recommended Range |               | Δ1 (bar)  |
|                  |        |      |               |             |        |                       | Min. low pt.      | Min. high pt. |           |
| Diaphragm        | 162    | 10   | 2.0           | 113195      | 0.010  | 0.015                 | 0.035             | 0.004         |           |
|                  |        |      | 2.5           | 113196      | 0.025  | 0.040                 | 0.080             | 0.005         |           |
|                  |        |      | 3.0           | 113197      | 0.045  | 0.080                 | 0.150             | 0.010         |           |
|                  |        |      | 3.5           | 113198      | 0.070  | 0.070                 | 0.240             | 0.014         |           |
|                  |        |      | 4.0           | 113199      | 0.115  | 0.150                 | 0.400             | 0.018         |           |
|                  |        |      | 5.0           | 113201      | 0.140  | 0.300                 | 0.650             | 0.050         |           |
|                  |        |      | 5.5           | 113202      | 0.250  | 0.600                 | 1.15              | 0.080         |           |
|                  | 071    | 20   | 4.5           | 113200      | 1.0    | 2.0                   | 4.7               | 0.350         |           |
|                  |        |      | 5.5           | 113202      | 2.1    | 4.0                   | 9.5               | 0.700         |           |
|                  |        |      | 6.5           | 114139      | 4.0    | 8.0                   | 14.4              | 1.6           |           |
|                  | Piston | 027  | 100           | 5.5         | 113202 | 16.0                  | 16.0              | 19.0          | 3.0       |
|                  |        |      |               | 6.5         | 114139 | 19.0                  | 19.0              | 38.0          | 6.5       |
|                  |        | 017  | 100           | 5.5         | 113202 | 38.0                  | 38.0              | 50.0          | 7.0       |
| 6.5              |        |      |               | 114139      | 50.0   | 50.0                  | 90.0              | 12.0          |           |
| Bellows          | 236    | 35   | 5.5           | 113202      | 5.5    | 11.0                  | 16.0              | 1.6           |           |
|                  |        |      | 6.5           | 114139      | 8.3    | 16.0                  | 28.0              | 2.5           |           |
|                  | 315    | 72   | 5.0           | 113201      | 17.5   | 28.0                  | 65.0              | 5.0           |           |

| <b>MAX. &amp; MIN.</b> | BMS     |      |               | SPRING                              |        | MAX. & MIN.           |               | INTERVALS |          |
|------------------------|---------|------|---------------|-------------------------------------|--------|-----------------------|---------------|-----------|----------|
|                        | Type    | Size | PMS box (bar) | Ø wire (mm)                         | Code   | P setting (bar)       |               | Δ1 & Δ2   |          |
|                        |         |      |               |                                     |        | Min. low pt. possible | Max. high pt. | Δ1 (bar)  | Δ2 (bar) |
|                        |         |      |               |                                     |        |                       |               |           |          |
| Diaphragm              | 162     | 10   | 2.0           | 113195                              | 0.010  | 0.035                 | 0.004         | 0.010     |          |
|                        |         |      | 2.5           | 113196                              | 0.025  | 0.080                 | 0.005         | 0.025     |          |
|                        |         |      | 3.0           | 113197                              | 0.045  | 0.140                 | 0.010         | 0.050     |          |
|                        |         |      | 3.5           | 113198                              | 0.070  | 0.240                 | 0.014         | 0.060     |          |
|                        |         |      | 4.0           | 113199                              | 0.115  | 0.380                 | 0.018         | 0.150     |          |
|                        |         |      | 5.0           | 113201                              | 0.140  | 0.750                 | 0.050         | 0.350     |          |
|                        |         |      | 5.5           | 113202                              | 0.230  | 1.3                   | 0.080         | 0.600     |          |
|                        | 071     | 20   | 4.5           | 113200                              | 1.0    | 5.1                   | 0.350         | 2.5       |          |
|                        |         |      | 5.5           | 113202                              | 2.1    | 11.0                  | 0.700         | 5.5       |          |
|                        |         |      | 6.5           | 114139                              | 4.0    | 16.0                  | 1.6           | 10.0      |          |
|                        | Piston  | 027  | 100           | <i>Not possible with only 1 BMS</i> |        |                       |               |           |          |
|                        |         | 017  |               |                                     |        |                       |               |           |          |
|                        | Bellows | 236  | 35            | 5.5                                 | 113202 | 5.5                   | 22.0          | 1.6       | 10.0     |
| 6.5                    |         |      |               | 114139                              | 8.3    | 35.0                  | 2.5           | 20.0      |          |
| 315                    |         | 72   | 5.0           | 113201                              | 17.5   | 72.0                  | 5.0           | 33.0      |          |

# OS2 NACE

## DEFINITIONS

|                       |   |
|-----------------------|---|
| PMS box               | Maximum operational box pressure  |
| Pa                    | Nominal downstream regulator pressure   |
| Pa max                | Maximum downstream regulator pressure (normally closing regulator pressure)   |
| Pa min                | Minimum downstream regulator pressure (disturbance in function with flow and/or inlet pressure is to be considered) |
| <b>Pd max</b>         | Maximum releasing pressure  |
| Max. high pt.         | High regulator pressure at maximum  |
| Max. low pt.          | Low regulator pressure at maximum remaining within the accuracy class   |
| Max. low pt. possible | Low regulator pressure at furthest maximum point (precision is not guaranteed)                                      |
| <b>Pd min</b>         | Minimum releasing pressure  |
| Min. high pt.         | High minimum regulator pressure   |
| Min. low pt.          | Low regulator pressure at minimum remaining within the accuracy class   |
| Min. low pt. possible | Low regulator pressure at furthest minimum point (precision is not guaranteed)                                      |
| <b>Δ1</b>             | Minimum difference allowed between Pd max. and Pa max. and/or between Pd min. and Pa min.                           |
| <b>Δ2</b>             | Maximum difference allowed between maximum and minimum releasing pressure   |

## SELECTION GUIDE LINES: PRESSURE LIMITATIONS

| Max. only  | Min. only  | Max. & Min.  |
|--|--|--|
| Pd max. ≤ PMS box (BMS)<br>Pd max. ≤ Max. high pt.<br>Pd max. ≥ Max. low pt.<br>Pd max. ≥ Pa max. + Δ1 | Pa max. < PMS box (BMS)<br>Pd min. ≤ Min. high pt.<br>Pd min. ≥ Min. low pt.<br>Pd min. ≥ Pa min. - Δ1 | Pd max. ≤ PMS box (BMS)<br>Pd max. ≤ Max. high pt.<br>Pd max. ≥ Pa max. + Δ1<br>Pd min. ≥ Min. lowest pt. possible<br>Pd min. ≤ Pa min. - Δ1<br>Pd max. - Pd min. ≤ Δ2 |

Note: When the set point (max. or min.) falls between the lowest and lowest pt. possible, the precision may pass into a superior range (example AG 2.5 → AG 5). If the pt. value is too close to that of the Pa, the option RJGI tripping is recommended (consult factory). In the case of 2 safety manometric boxes (BMS) both boxes should have a PMS > to the highest Pd max.

## SELECTION OF BMS AND SPRINGS

Choose the type of safety manometric box (BMS) according to:  
PMS, the type of releasing precision

| PMS         | Diaphragm | Bellows | Piston |
|-------------|-----------|---------|--------|
| 0 - 20      |           |         |        |
| 20 - 72     |           | (*)     |        |
| 72 - 100    |           |         |        |
| AG 2.5      |           |         |        |
| AG 5        |           |         |        |
| Max. only   |           |         |        |
| Min. only   |           |         |        |
| Max. & min. |           |         |        |

(\*) Choice between piston (regular) and bellows (optional).  
Bellows are recommended if you require a small gap between releasing pressure, inlet pressure and exact precision.  
Pistons do not allow for minimum and maximum releasing.

Choice of springs:

- **Max. only or min. only**  
Take the spring with the highest point directly superior to the releasing pressure required.
- **Max. and min.**  
Take the spring with the highest maximum point superior to the maximum releasing pressure required or with the lowest point inferior to the minimum tripping pressure required.

## MATERIALS (BMS)

|                  | Diaphragm                  | Bellows         | Piston          | Piston NACE |
|------------------|----------------------------|-----------------|-----------------|-------------|
| Spring case      | Zinc pl steel              |                 | Stainless steel |             |
| Spring box       | Aluminium + Chromatisation |                 |                 |             |
| Diaphragm        | Nitrile mesh               |                 |                 |             |
| Piston           |                            |                 | Stainless steel |             |
| Bellows          |                            | Stainless steel |                 |             |
| Spring           | Zinc pl steel              |                 | Stainless steel |             |
| Adjustment screw | Zinc pl steel              |                 |                 |             |

|   |  |
|---|--|
| <b>WARNING</b><br><b>AUTHORIZED PERSONNEL ONLY</b><br><b>Risk of injury</b><br>After rearming, remove the reset key from the stem.<br>Do not put fingers in or near the reset mechanism area. |  |
|---|--|

## ADJUSTMENT (BMS)

Generally speaking, adjustments are carried out with the slam shut valve closed. Only the detection stage is reset. Control of the releasing value may be obtained by resetting the two stages.

### Warning

*Before any adjustment, check that the spring range installed corresponds to the required set point*

### BMS 1 (Diagrams 9 to 11 page 7)

#### RELEASING BY MAX. ONLY

##### • Adjusting the releasing screw

Free the min. hook (2).

Then in the following conditions:

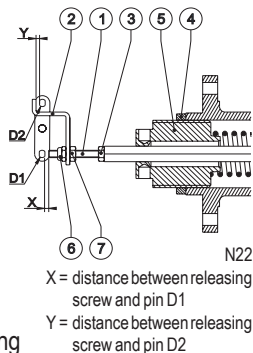
- no pressure in the safety manometric box (BMS),
- set-point spring compressed so that the distance between the releasing screw and the pin D1 no longer increases, adjust the releasing screw (1) to  $X = 1.5 \text{ mm}$  (detection stage set).

Jam nut (3).

##### • Adjusting the max. only releasing pressure

Admit the releasing pressure to Pd max.

- Screw the adjustment screw (5) until detection stage can be set.
  - Unscrew the adjustment screw (5) until detection stage release.
  - Check the pressure value at the releasing point (adjust if necessary).
- Jam nut (4).



#### RELEASING BY MIN. ONLY

##### • Adjusting the releasing screw and hook

Free the min. hook (2).

Then in the following conditions:

- set-point spring decompressed (adjustment screw (5) unscrewed),
  - pressure equal to the releasing pressure required for Pd min in the BMS,
- adjust the releasing screw (1) to  $X = 2 \text{ mm}$  (detection stage set).
- Jam nut (3).

Put the hook (2) into position and adjust  $Y = 1.5 \text{ mm}$  with nuts (6) and (7).

Jam nuts (6) and (7).

##### • Adjusting the min. only releasing pressure

Continue admitting the required releasing pressure.

- Screw the adjustment screw (5) until detection stage release.
  - Check the pressure value at the releasing point (adjust if necessary).
- Jam lock nut (4).

#### RELEASING BY MAX. AND MIN. (diaphragm or bellows only)

##### • Adjusting the releasing screw

Free the min. hook (2).

Then in the following conditions:

- set-point spring decompressed (adjustment screw (5) unscrewed),
- pressure equal to the max. releasing pressure required in the BMS,

adjust the releasing screw (1) to  $X = 0 \text{ mm}$  (detection stage set). Release manually.

Unscrew the releasing screw (1) 2 turns, which represents a distance of approximately 1.5 mm.

Jam nut (3).

##### • Max. adjustment

Same procedure as paragraph "Adjusting max. only releasing pressure".

##### • Min. adjustment

Admit an average pressure between max. and min., (for example: regulator set-point pressure).

Set the slam shut.

Admit a pressure equal to the min. Pd min. releasing pressure required.

Adjust the hook (2) by progressively moving nuts (6) and (7) until it releases.

Jam nuts (6) and (7).

Check the pressure value at the releasing point (adjust if necessary).

### BMS 2 with 1 max. only BMS 1

#### RELEASING BY MAX. ONLY

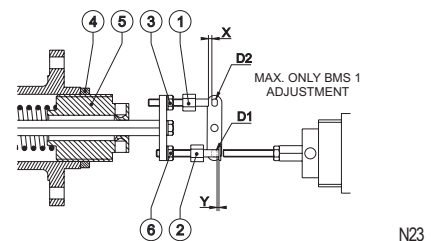
##### • Adjusting the max. push button

Remove the hook (2).

Then in the following conditions:

- no pressure in the BMS,
- set-point spring compressed so that the distance between the push button (1) and the pin D2 no longer increases, adjust the push button (1) to  $X = 1.5 \text{ mm}$  (detection stage set).

Jam nut (3).



##### • Adjusting the max. only releasing pressure

Same procedure as paragraph "Adjusting the max. only releasing pressure".

#### RELEASING BY MIN. ONLY

##### • Adjusting the min. only hook

Remove the max. push button (1) or screw it tight to neutralize it. Jam nut (3).

## ADJUSTMENT (BMS) (continued)

### RELEASING BY MIN. ONLY (CONTINUED)

Then in the following conditions:

- set-point spring decompressed (adjustment screw (5) unscrewed),
- pressure equal to releasing pressure required in the BMS, adjust the min. hook (2) to  $Y = 1.5 \text{ mm}$  (detection stage set). Jam nut (6).

#### • Adjusting min. only releasing pressure

Same procedure as paragraph "Adjusting max. only releasing pressure".

### RELEASING BY MAX. AND MIN.

#### • Adjusting the push button

The min. hook (2) is completely unscrewed.

Then in the following conditions:

- set-point spring decompressed (adjustment screw (5) unscrewed),
- pressure equal to the max. releasing pressure required in the BMS.

adjust the push button (1) to  $X = 0 \text{ mm}$  (detection stage set).

Release manually.

Unscrew the push button (1) 2 turns, which represents a distance of approximately 1.5 mm.

Jam nut (3).

#### • Adjusting the releasing pressure to max. and min.

##### Max. adjustment

Same procedure as paragraph "Adjusting the max. only releasing pressure".

##### Min. adjustment

Admit an average pressure between max. and min., (for example regulator set-point pressure).

Set the detection stage.

Admit a pressure equal to the min. releasing pressure required.

Screw the hook (2) progressively until detection stage release.

Jam nut (6).

Check the pressure value at the releasing point (adjust if necessary).

## MAINTENANCE (BMS)

### • Control

- Slam shut releasing (twice yearly)
- External tight shut
- Impulse part (diaphragm, bellows or piston)

### • Disassembly

- Unscrew the connector from the sensing line
- Remove the safety manometric box (BMS)
- Unscrew the blocking nut on the adjustment screw (manually)
- Unscrew the adjustment screw (resetting tool)
- Remove the hook or plate, depending on the type of BMS 1 or 2, from the detection rod (flat spanner 7)
- Remove the upper case
  - BMS 162 (flat spanner 11)
  - BMS 071 (flat spanner 8)
  - BMS piston 27/17 (key 5)
  - BMS bellows 236/315 (key 5)
- Disassemble the set plate/counter plate (Flat spanner 17 and pliers)  
or
- Remove the bellows or piston and guide (manually)

### • Assembly

- Proceed in reverse order to disassembly

### • BMS torque values

- Upper spring case/manometric box
  - BMS 162: 8 N.m
  - BMS 071: 5 N.m
  - BMS piston 27/17: 6 N.m
  - BMS bellows 236/315: 6 N.m
- BMS 162 and 071 nut/diaphragm plate: 20 N.m

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