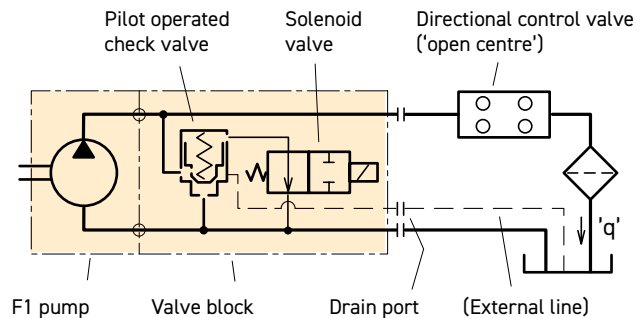


# TECHNICAL INFORMATION

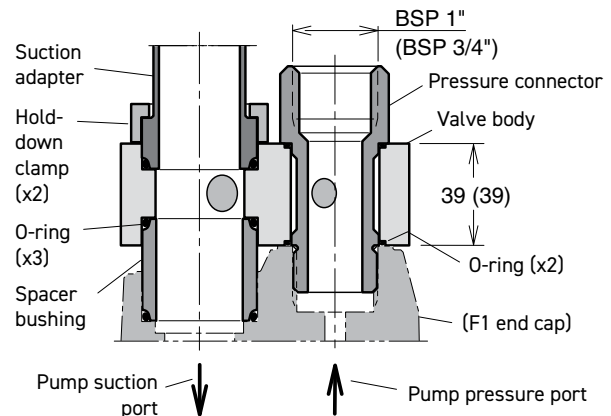
## Auxiliary Valves

### BPV-F1 and BPV-T1 bypass valve

- The bypass valve is mainly utilised in applications where the F1 pump is driven from the crank-shaft through a cardan shaft, or when it is installed on an engine PTO.
- The BPV bypass valve should be disengaged during transportation when the pump is operating constantly and the engine is running at max rpm; the hydraulic system is not sized for the large flow that would otherwise go through it.
- The BPV valve substantially reduces the energy loss during transportation.
- The valve installs directly on top of the pump end cap with a pressure port 'banjo' fitting and an inlet port spacer bushing with two cap screws; refer to the illustration to the right.
- As the BPV valve is symmetrical, it can be 'turned 180°' to prevent interference with chassis components; it can be utilised for either left hand or right hand pumps.
- The valve function must only be activated or released (by means of the 24 VDC solenoid) at no-load (below 20 bar) system pressure.



*Bypass valve schematic.*



### IMPORTANT INFORMATION

- In order to secure a cooling flow through the system, a separate drain line must be connected from the BPV-F1 drain line fitting directly to tank; (shown in the Installation Information Bulletin MSG30-8227-INST/UK/DE) refer also to the schematic.
- The pressure connector must be tightened (to 50 Nm) before the suction fitting clamp screws are tightened.

# ORDERING INFORMATION AND DRAWINGS

## BPV-F1 and BPV-T1 Bypass valve

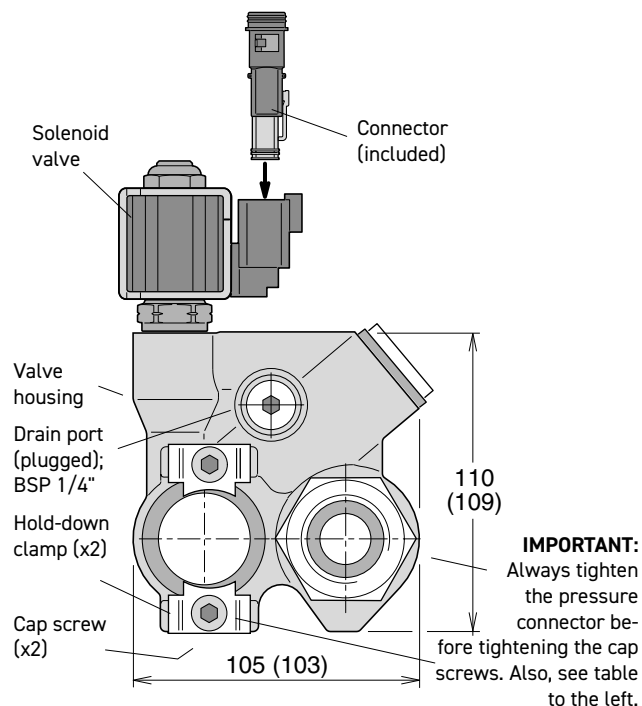
### Without manual override

| Bypass valve, type        | BPV-F1-25 to -101 and BPV-T1-81 and -121  |
|---------------------------|-------------------------------------------|
| Max pressure, continuous  | 350 bar                                   |
| intermittent              | 400 bar                                   |
| Solenoid voltage (option) | 24 VDC, (12 VDC)                          |
| Power requirement         | 14 W                                      |
| Operating mode            | Activated solenoid:<br>Check valve closed |

| Bypass valve                           | Voltage | Ordering number | For F1 and T1 size                                                                           | Torque <sup>1)</sup> |
|----------------------------------------|---------|-----------------|----------------------------------------------------------------------------------------------|----------------------|
| BPV-F1, BPV-T1                         | 24 VDC  | 378 7201        | F1-25 <sup>2)</sup> , -41, -51, -61 and T1-81                                                | 50 Nm                |
|                                        | 12 VDC  | 378 7202        |                                                                                              |                      |
| BPV-F1, BPV-T1                         | 24 VDC  | 378 7203        | F1-81, -101 and T1-121                                                                       | 100 Nm               |
|                                        | 12 VDC  | 378 7204        |                                                                                              |                      |
| Drain fitting kit <sup>2)</sup> F1-025 |         | 378 1640        | Contains a drain line fitting a bonded seal and nozzle.                                      |                      |
| Drain fitting kit other F1, T1 and F2  |         | 378 3039        | Contains a drain line fitting and a bonded seal. N.B. Included in the complete bypass valve. |                      |

1) Torque pressure connector to:

2) Drain fitting kit 378 1640 must be ordered separately for F1-025.



**NOTE:** Dimensions are shown for BPV-F1-81 (those for BPV-F1-25 are in parenthesis)

*BPV-F1 and -T1 installation and cross section without manual override*

## BPV-F1 and BPV-T1 Bypass valve

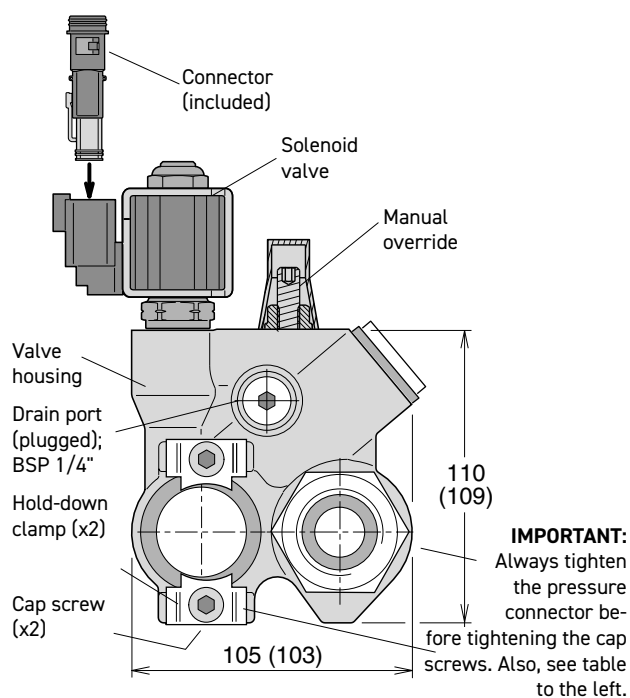
### With manual override

| Bypass valve, type       | BPV-F1-25 to -101 and BPV-T1-81 and -121  |
|--------------------------|-------------------------------------------|
| Max pressure, continuous | 350 bar                                   |
| intermittent             | 400 bar                                   |
| Solenoid voltage         | 24 VDC                                    |
| Power requirement        | 14 W                                      |
| Operating mode           | Activated solenoid:<br>Check valve closed |

| Bypass valve                           | Voltage | Ordering number | For F1 and T1 size                                                                           | Torque <sup>1)</sup> |
|----------------------------------------|---------|-----------------|----------------------------------------------------------------------------------------------|----------------------|
| BPV-F1, BPV-T1                         | 24 VDC  | 378 04179       | F1-25 <sup>2)</sup> , -41, -51, -61 and T1-81                                                | 50 Nm                |
|                                        | 24 VDC  | 37804180        | F1-81, -101 and T1-121                                                                       | 100 Nm               |
| Drain fitting kit <sup>2)</sup> F1-025 |         | 378 1640        | Contains a drain line fitting a bonded seal and nozzle.                                      |                      |
| Drain fitting kit other F1, T1 and F2  |         | 378 3039        | Contains a drain line fitting and a bonded seal. N.B. Included in the complete bypass valve. |                      |

1) Torque pressure connector to:

2) Drain fitting kit 378 1640 must be ordered separately for F1-025.



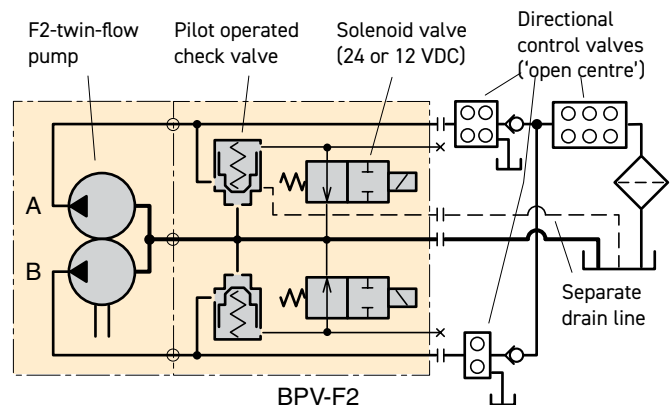
**NOTE:** Dimensions are shown for BPV-F1-81 (those for BPV-F1-25 are in parenthesis)

*BPV-F1 installation and cross section with manual override*

# TECHNICAL INFORMATION

## BPV-F2 bypass valve

- An F2 twin pump fitted with a bypass valve can be utilised in applications where the pump is operating constantly i.e. when the pump is driven from the crankshaft through a cardan shaft, or when it is installed on an engine-PTO. In addition, it can be used when, temporarily, one of the two circuits is not required; the power loss is thus reduced as the non-required flow is not forced through lines and 'open center' valves.
- The BPV bypass valve should be disengaged during transportation when the pump is operating constantly and the engine is running at max rpm; the hydraulic system is not sized for the large flow that would otherwise go through it.
- The BPV valve connects the outlet and inlet ports of the pump, and only a small oil flow goes through the system and to the reservoir.
- The valve is installed directly on top of the pump port surface with 'banjo' fittings and two cap screws (refer to the split view to the right).
- As the BPV valve is symmetrical it can be 'turned 180°' so as not to interfere with chassis components. The valve can accommodate left hand as well as right hand rotating pumps.
- The valve can only be engaged or disengaged (through the 24 or 12 VDC solenoid) at low system pressures (below 20 bar).



*Bypass valve circuit schematic (example).*

## IMPORTANT INFORMATION

- In order to secure a cooling flow through the system, a separate drain line must be connected from the BPV-F2 drain line fitting (shown in the split view) directly to tank; refer also to the schematic.
- The pressure connectors must be tightened (to 50 Nm) before the suction fitting clamp screws are tightened.

# ORDERING INFORMATION AND DRAWINGS

## BPV-F2 Bypass valve

### Without manual override

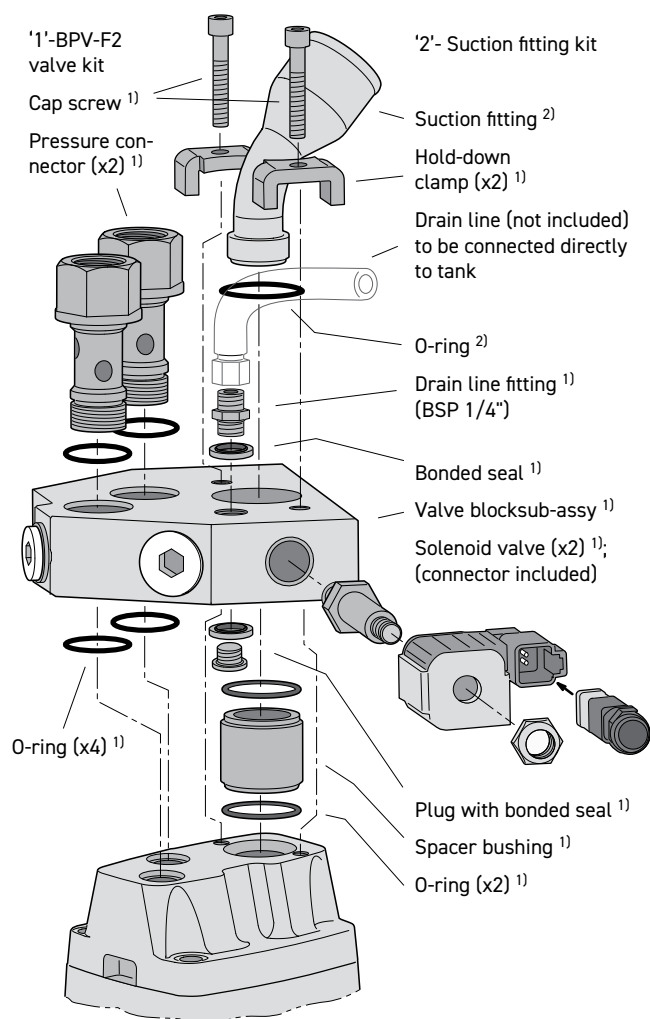
| Bypass valve, type        | BPV-F2                                    |
|---------------------------|-------------------------------------------|
| Max pressure, continuous  | 350 bar                                   |
| intermittent              | 400 bar                                   |
| Solenoid voltage (option) | 24 VDC, (12 VDC)                          |
| Power requirement         | 14 W (each solenoid)                      |
| Operating mode            | Activated solenoid:<br>Check valve closed |

| Bypass valve <sup>1)</sup> | Voltage | Ordering number | For F2 size | Torque <sup>3)</sup> |
|----------------------------|---------|-----------------|-------------|----------------------|
| BPV-F2,                    | 24 VDC  | 378 7424        | All         | 50 Nm                |
|                            | 12 VDC  | 378 7425        | Sizes       |                      |

1) The BPV-F2 valve kit contains parts designated '1' in the split view to the right.

2) A suction fitting kit (parts designated '2' in the split view) is not included with the F2 pump; it must be ordered separately (refer to page 72).

3) Torque pressure connector to:



*Bypass valve split view without manual override (with F2 end cap).*

**NOTE:** A suction fitting kit (parts designated '2' in the split view) is not included with the F2 pump; it must be ordered separately (refer to cpage 72ff).

## BPV-F2 Bypass valve

### With manual override

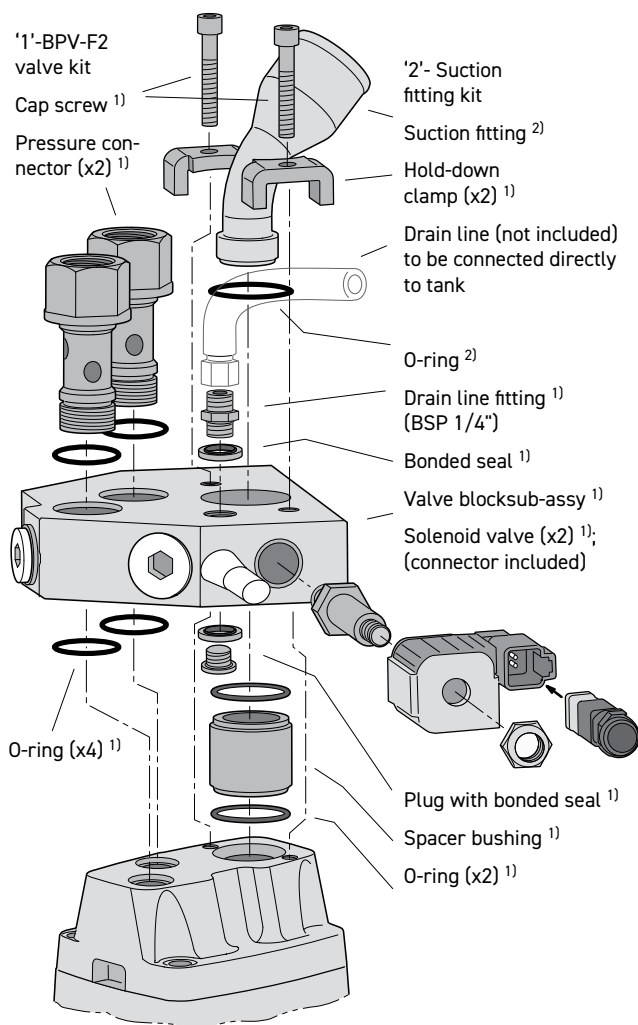
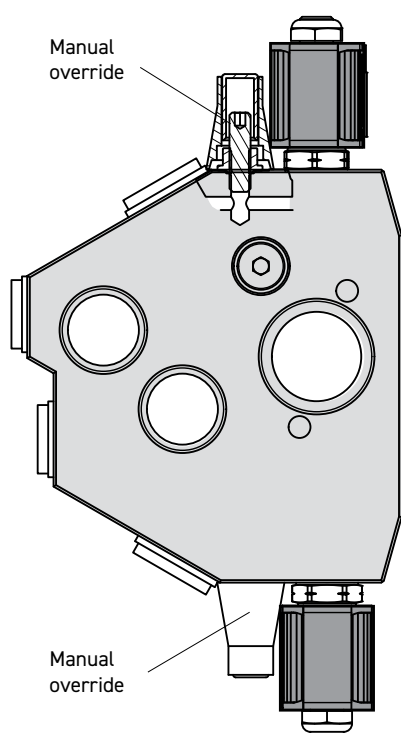
| Bypass valve, type        | BPV-F2                                    |
|---------------------------|-------------------------------------------|
| Max pressure, continuous  | 350 bar                                   |
| intermittent              | 400 bar                                   |
| Solenoid voltage (option) | 24 VDC                                    |
| Power requirement         | 14 W (each solenoid)                      |
| Operating mode            | Activated solenoid:<br>Check valve closed |

| Bypass valve <sup>1)</sup> | Voltage | Ordering number | For F2 size | Torque <sup>3)</sup> |
|----------------------------|---------|-----------------|-------------|----------------------|
| BPV-F2,                    | 24 VDC  | 378 4377        | All Sizes   | 50 Nm                |

1) The BPV-F2 valve kit contains parts designated '1' in the split view to the right.

2) A suction fitting kit (parts designated '2' in the split view) is not included with the F2 pump; it must be ordered separately (refer to page 72).

3) Torque pressure connector to:



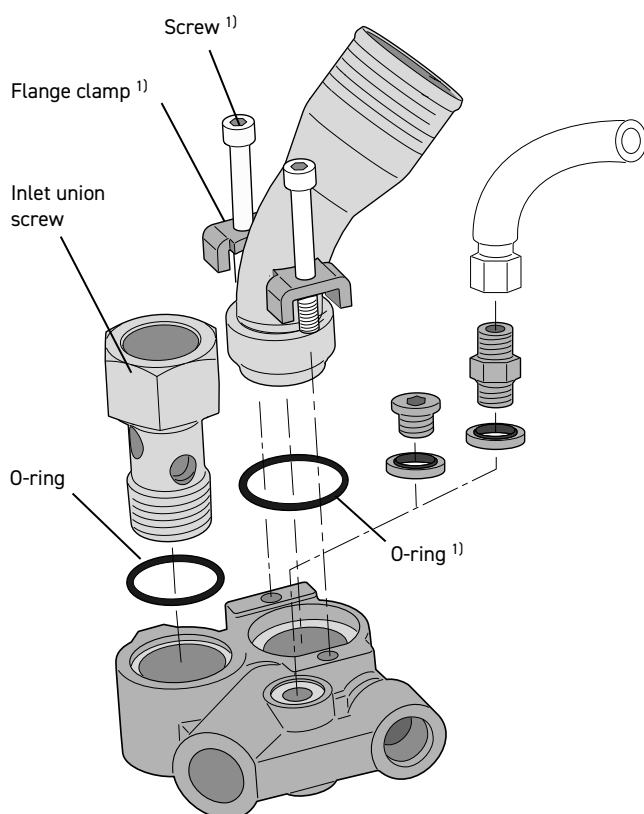
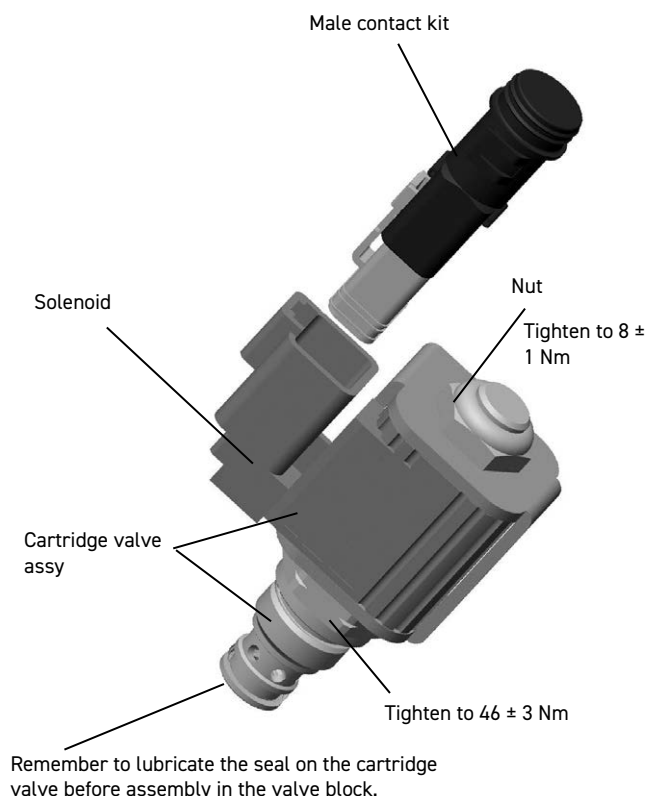
*Bypass valve split view with manual override (with F2 end cap).*

**NOTE:** A suction fitting kit (parts designated '2' in the split view) is not included with the F2 pump; it must be ordered separately (refer to page 59 ff).

# TECHNICAL INFORMATION

## BPV-F1, -T1, -F2, -F3 and -F4 Accessories / Spare Parts

| Part No | Description               | Remarks             |
|---------|---------------------------|---------------------|
| 3787496 | Solenoid 24 V             | Incl. new connector |
| 3787497 | Solenoid 12 V             | Incl. new connector |
| 3787494 | Cartridge valve assy 24 V | Incl. new connector |
| 3787495 | Cartridge valve assy 12 V | Incl. new connector |
| 3785948 | Nut for cartridge valve   |                     |
| 3787488 | Male contact kit          |                     |



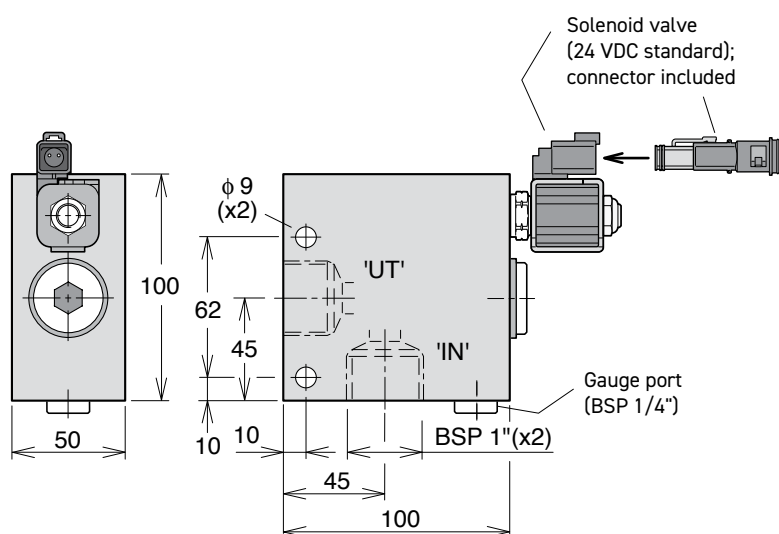
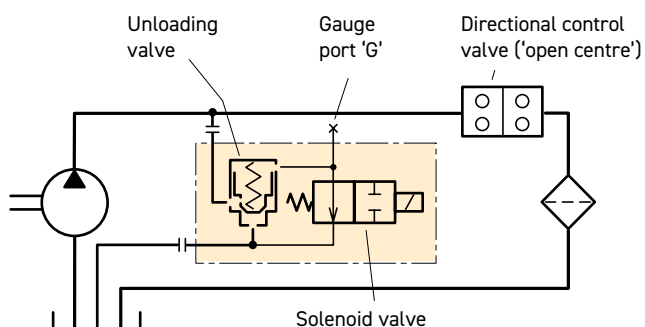
| Part No | Description                                   | Remarks                               |
|---------|-----------------------------------------------|---------------------------------------|
| 3781480 | Inlet union screw                             | F2 (all sizes)                        |
| 3781082 | Inlet union screw                             | F1-25, -41, -51, -61 and T1-81        |
| 3781094 | Inlet union screw                             | F1-81, -101, T1-121, and F3-81, -101  |
| 3780641 | O-ring kit                                    | For F1, T1, F2, F3 and F4 (all sizes) |
| 3782439 | Hold-down clamp Suction fitting <sup>1)</sup> | For BPV F1, T1, F2, F3 and F4         |

<sup>1)</sup> Hold-down clamp for suction fitting on bypass valve for F1, T1, F2 and F3 (parts designated '1' in the split view).

## BPV-L line mounted bypass valve

- The unloading valve BPV-L is utilised in hydraulic systems where the fixed displacement pump is engaged constantly and no flow is required, i.e. during transportation. The flow is directed through the unloading valve which has a low pressure loss and less heat is being generated in the system.
- When the solenoid is activated the unloading valve closes and the pump flow is directed to the directional control valve or other user.

| Unloading valve, type        | BPV-L                                     |
|------------------------------|-------------------------------------------|
| Max operating pressure [bar] | 350                                       |
| Max flow [l/min]             | 250                                       |
| Solenoid voltage [VDC]       | 24                                        |
| Required power [W]           | 14                                        |
| Operating mode               | Activated solenoid:<br>Check valve closed |
| Ordering number              | 378 1487                                  |



## VP1 installation on an engine PTO

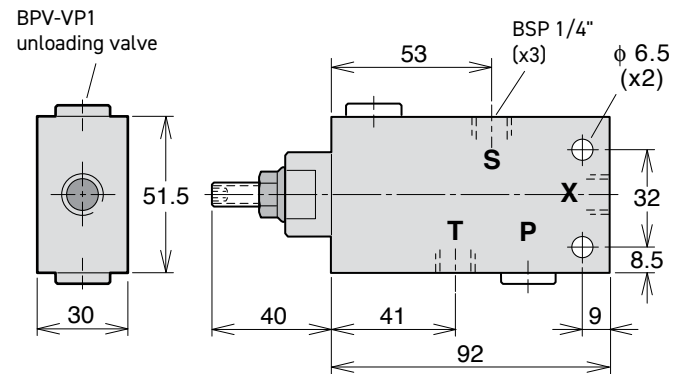
### BPV-VP1 unloading valve

The BPV-VP1 unloading valve is utilized in hydraulic systems where the pump is in constant operation.

- The valve protects the pump from being overheated in the off-load mode by allowing a small flow through the pump. When load sensing valve function is engaged, the bypass flow is cut off (as port 'X' is being pressurized).
- The valve will also de-air the suction line and the pump body after a long standstill.
- (The pump is assembled above the oil-tank and during the standstill some of the oil in the pump housing has been drained back to the oil-tank)

| Valve type | Ordering number |
|------------|-----------------|
| BPV-VP1    | 379 8799        |

**NOTE:** - BPV-VP1 with VP1-045, -060 or -075 and  
- BPV-VP1 with VP1-095, -110 or -130,  
see next page.



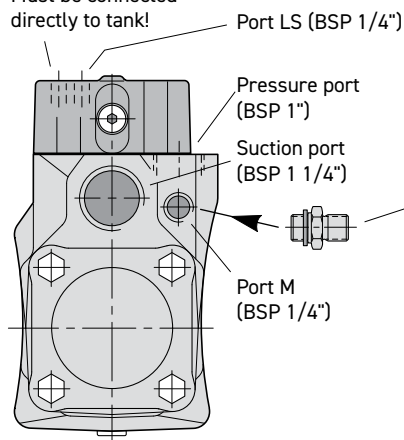
*BPV-VP1 unloading valve.*

For more information also see MSG30-8226-INST/UK, Installation Information Unloading Valve BPV for VP1



## BVP-VP1 with VP1-045/-060/-075 pumps

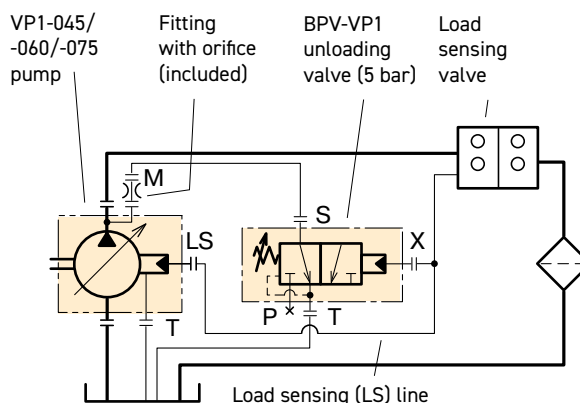
Port T (BSP 1/4")  
Must be connected  
directly to tank!



### NOTE:

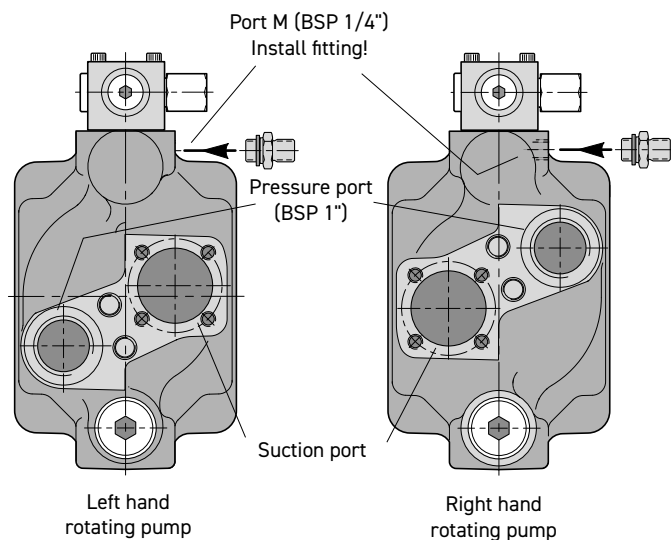
- Install the fitting (included) in port M and connect it, in turn, to port S of the unloading valve (see schematic).
- An orifice is included in the fitting. Connection on the fitting is 1/4" BSP threads. Size of orifice in the fitting is  $\varnothing$  1.5 mm.

VP1-045/-060/-075 end view (showing ports).



BPV-VP1 installation schematic with VP1-045/-060/-075 pump.

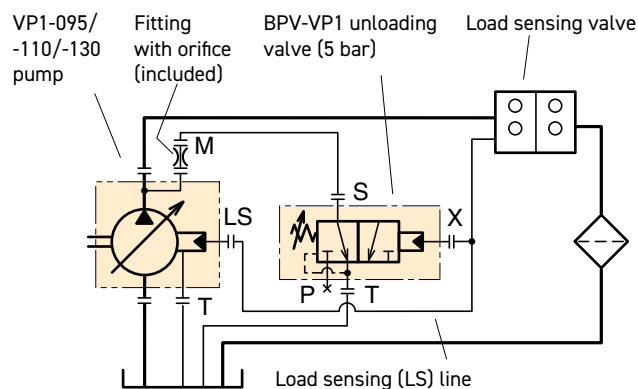
## BPV-VP1 with VP1-095/-110/-130 pumps



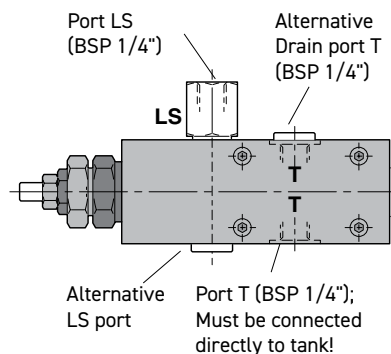
VP1-095/-110/-130 main ports (with fitting installation).

### NOTE:

- Install the fitting (included) in port M and connect it, in turn, to port S of the unloading valve (see schematic).
- An orifice is included in the fitting. Connection on the fitting is 1/4" BSP threads. Size of orifice in the fitting is  $\varnothing$  1.5 mm.



BPV-VP1 installation schematic with VP1-095/-110/-130 pump.



VP1-095/-110/-130 control valve ports.