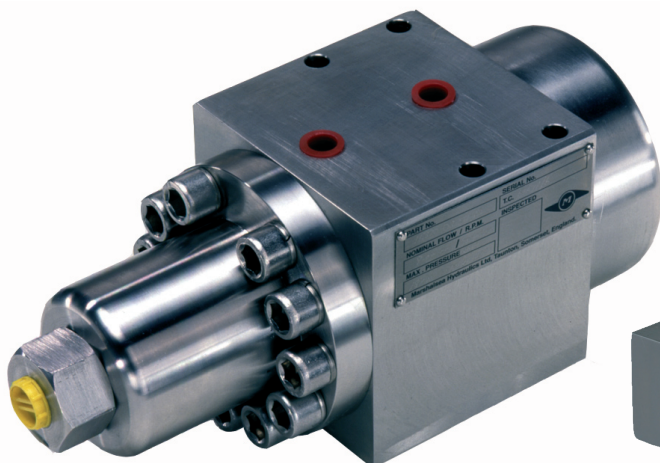
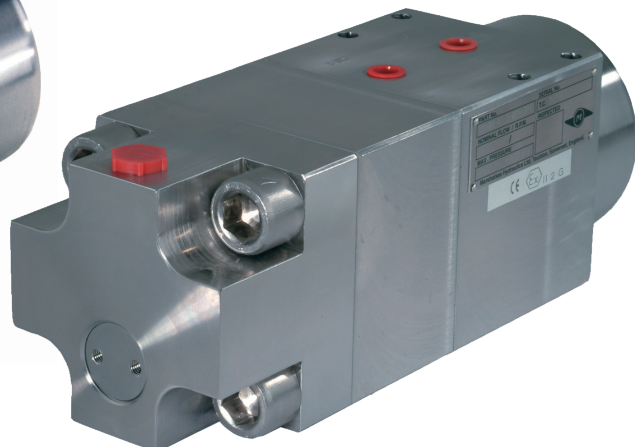


HI 11380 Pressure Intensifier (topside model)



HI 11380-xx-01 model (without vent valve)



HI 11380-xx-02 model (with vent valve)

- ▶ Designed to boost any water-based or mineral/synthetic oil-based fluid.
- ▶ Boosts inlet pressure up to 10 times without external power.
- ▶ When system pressure is achieved, no consumption of expensive hydraulic fluid. Maximum outlet 1,500 bars.
- ▶ Manufactured from 316 (standard), or from duplex stainless steels; – no painting required for hostile environments.
- ▶ Costs reduced – no electrical supply or controls required.
- ▶ Two versions – with and without a pilot-operated vent valve for the high pressure line.



This pressure intensifier conforms to Directive 94/9/EC relating to equipment intended for use in potentially explosive atmospheres and is ATEX (ATmosphere EXplosible) certified.



Marshalsea Hydraulics has been assessed by SGS Société Générale de Surveillance SA and certified as meeting the requirements of ISO 9001:2000 for the design, development, manufacture and servicing of hydraulic pumps, relief valves and intensifiers.

The HI 11380 Intensifier amplifies the inlet pressure to a higher outlet pressure by a pre-determined ratio. Standard ratios are shown in the table below; special ratios are available on request.

Pressure in the high pressure line can become reduced as a result of a system leak or the use of the stored (pressure) energy. Using virtually no energy, the HI 11380 restores and maintains that pressure in such instances. Rapid adjustment of the high pressure line can be achieved by varying the inlet pressure as the high pressure is directly proportional to the inlet pressure. Check and changeover valves are integrated within the main body of the intensifier as is the pilot-operated vent valve in the 11380-xx-02 version. When *the inlet pressure x the ratio = the outlet pressure*, then the HI 11380 is in a stalled condition and there is no consumption of fluid. The maximum outlet pressure that can be offered is currently 1,500 bars.

The HI 11380 was designed principally for applications in the offshore oil and gas industry where the highest standards of product performance and durability are essential. The HI 11380 is manufactured from 316 stainless steel to withstand hostile environments; it can operate on all water-based glycol fluids or on mineral and synthetic oils. This product is ideal for charging accumulators from a low pressure supply; it may also be used for operating several different systems from a single supply.

The *required ratio = required high pressure / inlet pumped or regulated pressure*. Available ratios can be selected from the table below. Ensure that the inlet pressure does not exceed the pressure given in this table which also offers a guide to approximate charging flow rates in litres/min.

| Product number | Ratio | Maximum inlet pressure (bars) | HP piston swept volume (cc) | Flow at 1 stroke/sec (l/m) |
|----------------|-------|-------------------------------|-----------------------------|----------------------------|
| 11380-02 | 2:1 | 345 | 36.37 | 2.18 |
| 11380-H2 | 2.5:1 | 345 | 26.00 | 1.56 |
| 11380-03 | 3:1 | 345 | 24.22 | 1.45 |
| 11380-04 | 4:1 | 345 | 18.17 | 1.10 |
| 11380-05 | 5:1 | 300 | 14.54 | 0.87 |
| 11380-06 | 6:1 | 250 | 12.11 | 0.73 |
| 11380-07 | 7:1 | 215 | 10.36 | 0.62 |
| 11380-08 | 8:1 | 185 | 9.06 | 0.54 |
| 11380-09 | 9:1 | 165 | 8.06 | 0.48 |
| 11380-10 | 10:1 | 150 | 7.25 | 0.44 |

General description

Applications

Product selection



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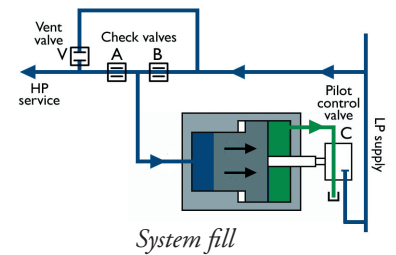
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These basic product numbers (**BPN**) can be extended to accommodate additional options as indicated in the following table.

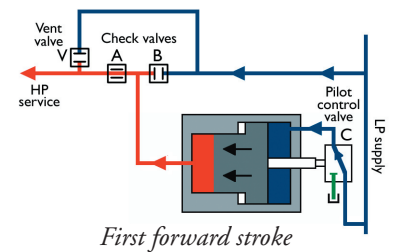
| Product number | Inlet connection | Outlet connection |
|---|------------------|-------------------|
| Model without pilot-operated vent valve | | |
| BPN-01-11 | 1/4" NPT | 1/4" NPT |
| BPN-01-12 | 1/4" NPT | 1/4" BSP |
| BPN-01-13 | 1/4" NPT | 3/8" MP Butech |
| BPN-01-21 | 1/4" BSP | 1/4" NPT |
| BPN-01-22 | 1/4" BSP | 1/4" BSP |
| BPN-01-23 | 1/4" BSP | 3/8" MP Butech |
| Model which includes pilot-operated vent valve | | |
| BPN-02-11 | 1/4" NPT | 1/4" NPT |
| BPN-02-12 | 1/4" NPT | 1/4" BSP |
| BPN-02-13 | 1/4" NPT | 3/8" MP Butech |
| BPN-02-21 | 1/4" BSP | 1/4" NPT |
| BPN-02-22 | 1/4" BSP | 1/4" BSP |
| BPN-02-23 | 1/4" BSP | 3/8" MP Butech |

Method of operation

On startup the system fills from the low pressure (LP) supply line. The LP pressure on the left of the piston pushes it to the right against the zero pressure tank fluid. When it reaches the end of its travel, the pilot control valve C reverses.



The LP supply fluid can now invade the right hand end of the cylinder where the piston's surface area is larger than at the HP end. The greater force (pressure x area) pushes the piston to the left on its first forward stroke. The increased pressure generated at the HP end closes check valve B and is the first step in building the pressure in the HP service line.

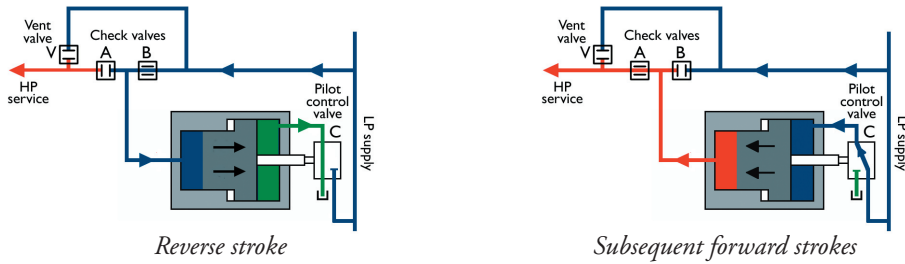


Subsequent forward and reverse strokes are shown below. With valve A open and valve B closed the piston moves forward to inject fluid into the HP service line. For the reverse stroke valve B is open and valve A closed..

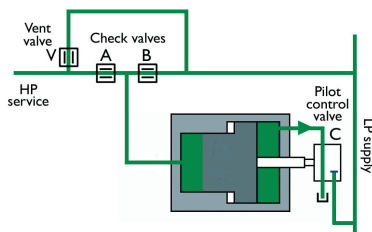
On these diagrams:
 Red = high pressure
 Blue = low pressure
 Green = exhausted fluid

The intensifier typically becomes stalled in the forward stroke position with *the LP inlet pressure x the ratio = the HP outlet pressure*. In this situation there is no consumption of hydraulic fluid with both pistons in a static state with pressure locked between the valves **A** and **B**. The device can sit indefinitely in this position . . . but the instant there is a drop in the HP pressure line, the piston moves further forward to recover the desired pressure.

On these diagrams:
Red = high pressure
Blue = low pressure
Green = exhausted fluid



The pilot-operated vent valve shown as **V** in these diagrams is included on the HI 11380–xx–02 models but omitted in the HI 11380–xx–01 models. With the HI 11380–xx–02, if for any reason the low pressure supply is interrupted, the system floods with zero pressure "tank" fluid. In such a circumstance, the pilot-operated vent valve **V** is no longer held closed by the input pressure – it opens so that the high pressure is safely vented away.



Manufactured from 316 stainless steel with nitrile seals. Weight 11 kgs (HI 11380–xx–01 model) or 26 kgs (HI 11380–xx–02 models) .

Material

Suitable for use with mineral/synthetic oils and all water-based fluids such as HW540, HW443 and Tranaqua HT, plus many others. The fluids used should be to a cleanliness standard of NAS 1638 class 6.

Fluids



The pressure intensifier can be mounted vertically or horizontally.

Mounting

Customised versions can be produced. For example, the intensifier pictured here has customer specified connections and mounting.

Custom versions



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System temperature

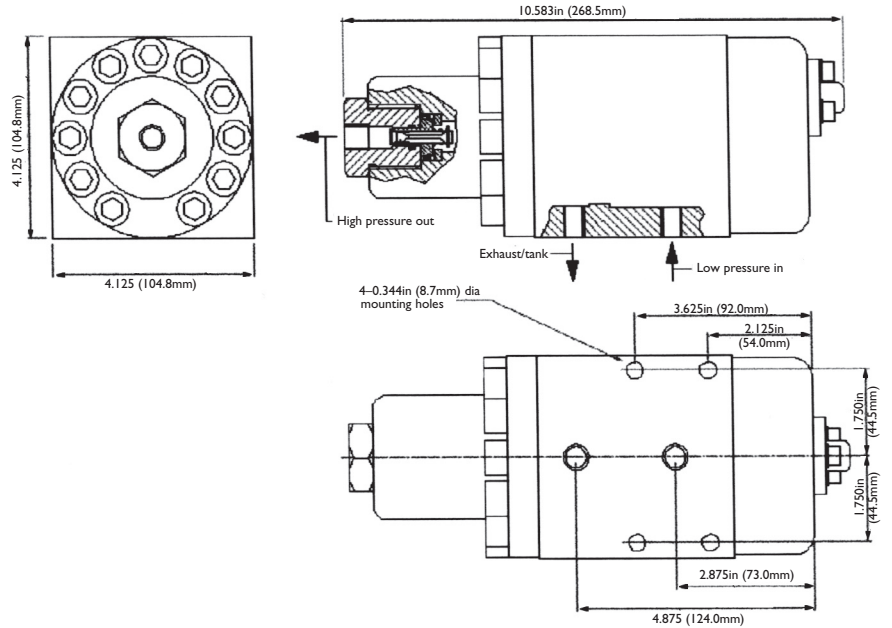
The HI 11380 has been qualified to operate at temperatures from -10°C to $+80^{\circ}\text{C}$ at pressures up to a maximum of 1,500 bars.

Safety note

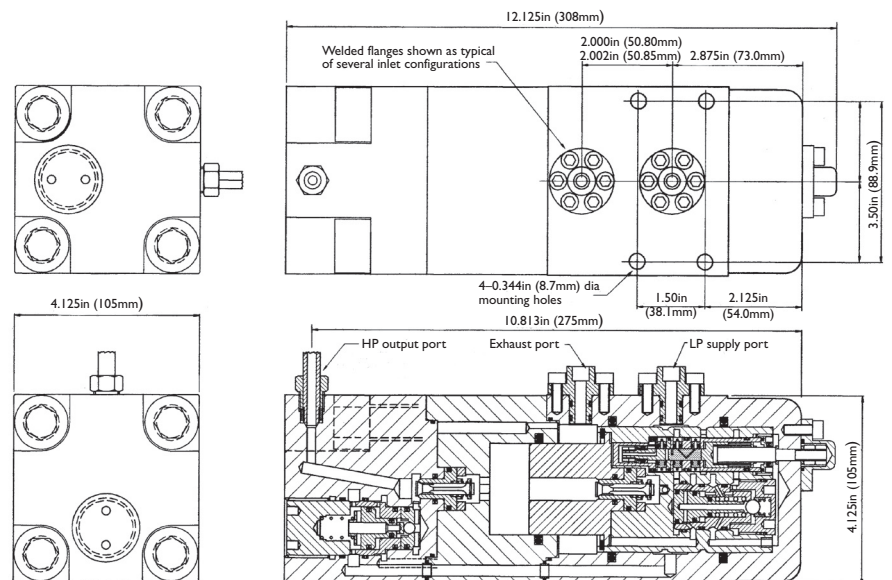
The inlet pressure of the intensifier should be carefully controlled, as the outlet pressure increases by the ratio of the pump in use. For example, if an 8:1 intensifier is being used, a rise in the inlet pressure of 125 bars will immediately increase the outlet pressure by 1,000 bars.

A relief valve set at the maximum pump rating should be fitted immediately downstream of the pump delivery port.

HI 11380-xx-01 drawing giving dimensions



HI 11380-xx-02 drawing giving dimensions





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