

# IPX1 & IPX4 TUBE PLUGGING GUN



## IPX1 & IPX4 PLUG INSTALLATION SET

The installation set consists of a hydraulic ram and hose with an air-driven hydraulic foot pump. The set is supplied in a robust plastic trolley case. The ram is specially designed to install the IPX1 & IPX4 Plugs and a high level of safety was taken into account in this design.

The ram has a robust breakout protection as standard. In the most extreme case, this prevents the pull rod from coming out of the ram. It is possible to remove this breakout protection when working in very small or limited spaces. In addition, the ram always installs the plug in one go. This saves time, prevents human error, improves the performance of the IPX1 & IPX4 Plugs and prevents damage to the tools.



## BRUSH SET

Before the tube or tube sheet is safely sealed, the inside must be brushed. The plug brush has been developed for 3 applications:

- ▶ Cleaning, removal of deposits, pitting and oxidation / corrosion
- ▶ Re-rounding the tube or tube sheet hole
- ▶ Roughening the material surface so that the plug gets a good grip.

Two versions of brushes are available: a HT brush for hard materials and a brush for soft materials. The brushes are available in three ways: separately or as a kit within the IPX4 size range. In addition, we supply the brushes as a complete set in a case. Enabling you to always have the correct brush size at hand.



## PULL ROD EXTENSION

To install a plug, the complete pull rod is required. If necessary, a pull rod extension can be added. The pull rod extension is used if water boxes, channel heads and/ or baffles are present or with Air Fin Coolers. The extension is connected to the (standard) complete pull rod. The pull rod extension is available as standard in lengths of 300mm. This allows the user to build up the complete system in steps to the desired length.

## PLUG REMOVAL TOOL

In rare cases, it may be necessary to remove plugs. For example, if the pipe is insufficiently pre-processed or is cracked/ torn during excessive (post-) rolling. With the plug removal tool, plugs can be removed evenly, quickly and easily. This manual tool consists of one whole piece that makes it strong, robust and durable.



## IPX1 SERIES

An IPX1 kit consists of 10 plugs, a brush and a sizing calibre. X1 Plugs are available in the following materials: Carbon steel (C), Brass (B), Duplex (D) and Stainless Steel 316L (S), 304L (E), 321 (ST), 904L (SV), Monel (M), 16Mo3 (A) and Titanium (T). Other materials are available upon request.

Always choose a material similar to the pipe of the heat exchanger! This will prevent chemical and/or thermal reactions between materials.

### OPERATING PRESSURE AND TEMPERATURE IPX1

The IPX1 can withstand extremely high working pressures and therefore works in all heat exchangers under the toughest conditions. The maximum working pressure and temperature of the IPX1 depend on the size and material of the plug. If the application sets even higher requirements for the plug than what is already possible by default, we can carry out additional examinations and tests on request to meet your specific requirements.

| RANGE(MM)     | PLUG      | POSITIONER  | PULL ROD | PULL ROD EXTENSION | PLUG REMOVAL TOOL |
|---------------|-----------|-------------|----------|--------------------|-------------------|
| 10.0 - 10.5MM | IPK-100-X | IPPP100     | IPST-M05 | IPSTV-M05          | IPVG100-110       |
| 10.5 - 11.0MM | IPK-105-X | IPPP105-110 |          |                    |                   |
| 11.0 - 11.5MM | IPK-110-X |             |          |                    |                   |
| 11.5 - 12.0MM | IPK-115-X | IPPP115-125 | IPST-M06 | IPSTV-M06          | IPVG115-125       |
| 12.0 - 12.5MM | IPK-120-X |             |          |                    |                   |
| 12.5 - 13.0MM | IPK-125-X |             |          |                    |                   |
| 13.0 - 13.5MM | IPK-130-X | IPPP130-145 | IPST-M08 | IPSTV-M08          | IPVG130-165       |
| 13.5 - 14.0MM | IPK-135-X |             |          |                    |                   |
| 14.0 - 14.5MM | IPK-140-X |             |          |                    |                   |
| 14.5 - 15.0MM | IPK-145-X | IPPP150-165 | IPST-M08 | IPSTV-M08          | IPVG170-245       |
| 15.0 - 15.5MM | IPK-150-X |             |          |                    |                   |
| 15.5 - 16.0MM | IPK-155-X |             |          |                    |                   |
| 16.0 - 16.5MM | IPK-160-X | IPPP170-190 | IPST-M08 | IPSTV-M08          | IPVG220-265       |
| 16.5 - 17.0MM | IPK-165-X |             |          |                    |                   |
| 17.0 - 17.5MM | IPK-170-X |             |          |                    |                   |
| 17.5 - 18.0MM | IPK-175-X | IPPP195-215 | IPST-M08 | IPSTV-M08          | IPVG220-265       |
| 18.0 - 18.5MM | IPK-180-X |             |          |                    |                   |
| 18.5 - 19.0MM | IPK-185-X |             |          |                    |                   |
| 19.0 - 19.5MM | IPK-190-X | IPPP220-240 | IPST-M10 | IPSTV-M10          | IPVG220-265       |
| 19.5 - 20.0MM | IPK-195-X |             |          |                    |                   |
| 20.0 - 20.5MM | IPK-200-X |             |          |                    |                   |
| 20.5 - 21.0MM | IPK-205-X | IPPP245-265 | IPST-M10 | IPSTV-M10          | IPVG220-265       |
| 21.0 - 21.5MM | IPK-210-X |             |          |                    |                   |
| 21.5 - 22.0MM | IPK-215-X |             |          |                    |                   |
| 22.0 - 22.5MM | IPK-220-X | IPPP220-240 | IPST-M10 | IPSTV-M10          | IPVG220-265       |
| 22.5 - 23.0MM | IPK-225-X |             |          |                    |                   |
| 23.0 - 23.5MM | IPK-230-X |             |          |                    |                   |
| 23.5 - 24.0MM | IPK-235-X | IPPP245-265 | IPST-M10 | IPSTV-M10          | IPVG220-265       |
| 24.0 - 24.5MM | IPK-240-X |             |          |                    |                   |
| 24.5 - 25.0MM | IPK-245-X |             |          |                    |                   |
| 25.0 - 25.5MM | IPK-250-X | IPPP245-265 | IPST-M10 | IPSTV-M10          | IPVG220-265       |
| 25.5 - 26.0MM | IPK-255-X |             |          |                    |                   |
| 26.0 - 26.5MM | IPK-260-X |             |          |                    |                   |
| 26.5 - 27.0MM | IPK-265-X |             |          |                    |                   |

## IPX4 SERIES

An IPX4 kit consists of 10 plugs and a sizing calibre. The X4 plugs have a standard operating pressure (Ps) of 100 bar and a much larger range than the X1. The advantage of the larger range is that less stock is needed and that ordering the correct size is easier.

X4 Plugs are available in the following materials: Carbon steel (C), Brass (B), Monel (M), and Stainless Steel 316L (S) 304L (E), 321 (ST), 904L (SV). Other materials are available upon request. Always use a material similar to the material of the pipe and pipe plate to prevent thermal and/or chemical reactions between different materials.

### OPERATING PRESSURE AND TEMPERATURE IPX4

While the working pressure of the X4 is 100 bar, the temperature of the IPX4 remains dependent on the material of the plug. If the application sets even higher requirements for the plug than what is already possible by default, we can carry out additional examinations and tests on request to meet your specifications.

| RANGE(MM)     | PLUG      | POSITIONER      | PULL ROD | PULL ROD EXTENSION | PLUG REMOVAL TOOL |
|---------------|-----------|-----------------|----------|--------------------|-------------------|
| 13.5 - 14.5MM | IPPX4_135 | IPX4-PPB135-145 | IPST-M06 | IPSTV-M06-300      | IPVGX4-135-175    |
| 14.5 - 16.5MM | IPPX4_145 | IPX4-PPB145-160 |          |                    |                   |
| 15.5 - 17.0MM | IPPX4_155 | IPX4-PPB155-170 |          |                    |                   |
| 17.0 - 19.5MM | IPPX4_170 | IPX4-PPB170-195 | IPST-M08 | IPSTV-M08-300      | IPVGX4-170-195    |
| 19.5 - 22.0MM | IPPX4_195 | IPX4-PPB195-220 |          |                    |                   |
| 21.5 - 24.0MM | IPPX4_215 | IPX4-PPB215-240 |          |                    |                   |
| 24.0 - 26.5MM | IPPX4_240 | IPX4-PPB240-265 | IPST-M10 | IPSTV-M10-300      | IPVGX4-240-265    |
| 26.5 - 29.0MM | IPPX4_265 | IPX4-PPB265-290 |          |                    |                   |
| 29.0 - 31.5MM | IPPX4_290 | IPX4-PPB290-315 |          |                    |                   |
| 31.5 - 34.0MM | IPPX4_315 | IPX4-PPB315-340 | IPST-M10 | IPSTV-M10-300      | IPVGX4-315-340    |
| 34.0 - 36.5MM | IPPX4_340 | IPX4-PPB340-365 |          |                    |                   |
| 36.5 - 39.0MM | IPPX4_365 | IPX4-PPB365-390 |          |                    |                   |
| 39.0 - 41.5MM | IPPX4_390 | IPX4-PPB390-415 | IPST-M10 | IPSTV-M10-300      | IPVGX4-390-415    |
| 41.5 - 44.0MM | IPPX4_415 | IPX4-PPB415-440 |          |                    |                   |