

Hypercool

Water-cooled aftercooler
(removable tube bundle)/(fixed)



Service Catalogue

Date 31/08/2021

Assembly (see Fig. 1)

Aftercooler with separator STH (see Fig. 3)

Screw the separator onto the aftercooler outlet using the threaded curve (1-Fig. 3) or nipple (2-Fig. 3).

Aftercooler with separator SFH/SFV (see Fig. 4)

- Remove the tube bundle's protection plates.
- Attach gasket (4) and counterflange (5) to the aftercooler's (3) air inlet using the bolts (11); ensure that the gasket (2) is inserted correctly and that the bundle (1) is mounted with the reference marks coincidental.
- Attach gasket (6), O-ring (7), support (8) and gasket (9) to the aftercooler's (3) air outlet and then mount it (horizontally or vertically) to the separator, as described in the separator manual (*) in Fig. 1 shows position of separator.
- Attach gasket (13) and counterflange (10) to the separator's outlet using the bolts (12).

N.B.: Connect the optional thermometer (if supplied - for position see separator manual) only after the apparatus has been installed (to avoid damage).

Make sure that the flanges are parallel before tightening the flange bolts.

Aftercooler without separator

- Remove the tube bundle's protection plates.
- Attach gasket (4) and counterflange (5) to the aftercooler's (3) air inlet using the bolts (11); ensure that the gasket (2) is inserted correctly and that the bundle (1) is mounted with the reference marks coincidental.
- Attach gasket (6), O-ring (7), support (8), gasket (9) and counterflange (10) to the aftercooler's (3) air outlet using bolts (12).

Installation (see Fig. 2, 3, 4)

- Do not install the unit in the open air.
Install the unit only in environments which ensure an ambient temperature within the range specified on the data plate. These limits must be observed in all cases.
- Support the unit on suitable mountings.
- Install one or more safety valves as necessary on the air/gas side to ensure that maximum design pressure is never exceeded. These valves must be fitted in such a way that there is no risk of any expelled fluid coming into contact with operators.**
- If the pressurised fluid circuit is subject to vibration, use flexible hoses and vibration dampers to connect up the unit, or secure the circuit more firmly to eliminate the vibrations.
If the circuit is subject to pressure pulses of more than 10% rated pressure, install a pulse damper to reduce them to below this level.
The number of cycles at nominal pressure 0 must be less than 1000 over the lifetime of the machine.
- Make sure that the air around the unit does not contain contaminating solids or gases. Compressed and condensed gases can react to produce acids and other chemicals which could damage the unit.
Take particular care with sulphur, ammonia, chlorine and installations in marine environments. For further advice or assistance consult the manufacturer.
- Support the air/gas inlet and outlet pipes if they strain the connection ports and/or flanges.
- If the unit is installed in a seismic zone, install suitable devices to protect against seismic activity.
- Install fire-prevention and fire-fighting equipment suitable

for the area in which the unit is installed in order to protect it against fire.

- If operating temperature exceeds 60°C, fit any protective guards necessary to prevent accidental contact and burns.

RESPECT THE DIRECTION OF THE AIR/WATER INLET AND OUTLET LABELS.

AIR/GAS CONNECTIONS: Attach the compressed air piping to the threaded / flanged connections on the apparatus (if non-standard flanges are used, ensure that their internal diameter allows a free air passage to all the aftercooler's tubes).

The apparatus must be installed immediately down-stream of the compressor, and with the separator down-stream of the aftercooler.

WATER CONNECTIONS: Attach the cooling water piping to the aftercooler's threaded/flanged connections.

Ensure the following:

- The water inlet must always be below the water outlet (to maximize performance and allow water to drain out when idle).
- The water must drain away freely (to prevent water entering the compressed air tubing in the event of a fracture).
- For closed water circuits, ask for separate instructions and install a safety valve (set at a pressure below the maximum safe pressure of the weakest point in the circuit).
- Guarantee a constant water flow and install a water flow detector (eg. visible discharge to drain, sight glass, etc.) or an automatic compressor shut-down device.

•

Operation and maintenance

Maintenance must only be performed by specialist personnel.

FOR SEPARATOR SEE RESPECTIVE MANUAL.

The temperature of incoming fluids, must never exceed the maximum value specified on the data plate. If temperatures exceed the specified values, contact the manufacturer for further information.

Avoid subjecting the unit to thermal stress caused by repeated fluctuations in incoming fluid temperature.

To guarantee optimum operation, ensure that the maintenance program below is performed regularly, and that the following rules are respected:

- Ensure a constant water flow.
- Respect the fluid temperatures specified at the time of purchase of the unit; if this is not possible, contact the manufacturer for further information.
- Avoid rapid scaling by keeping the water outlet temperature as low as possible.
- Drain all water out of the aftercooler when it is not in operation (to prevent ice formation).

Maintenance program

AIR/GAS CIRCUIT

frequency: Every 1000--8000 hours of operation, depending on air quality and compressor type.

operation: Remove the carbon, tars and dust, formed on the insides of the aftercooler's tubes, using suitable solvents. Afterwards thoroughly dry the insides of the tubes using compressed air.

Check for signs of corrosion, in which case contact the authorised inspector or the supplier for authorisation to continue using the unit.

WATER CIRCUIT

frequency: After 1000-1200 hours of operation, and thereafter as appropriate according to the degree of encrustation (ie. the water hardness and temperature).

operation: Dismantle the aftercooler and clean both the tube bundle (1 - Fig. 1) and casing (3) as follows:

First clean with a high pressure water jet and then place in a warm chemical bath (containing a mild descaling agent). Finally rinse with water. Afterwards thoroughly dry the insides of the tubes using compressed air.

NOTE: It is advised to stock a spare set of gaskets.

IMPORTANT

-Please note that stainless steel aftercoolers should not be used with sea water. Static sea water is corrosive for stainless steels and if the sea water is drained, allowing sea ambient air to come into contact with the water side of stainless steel, corrosion continues.

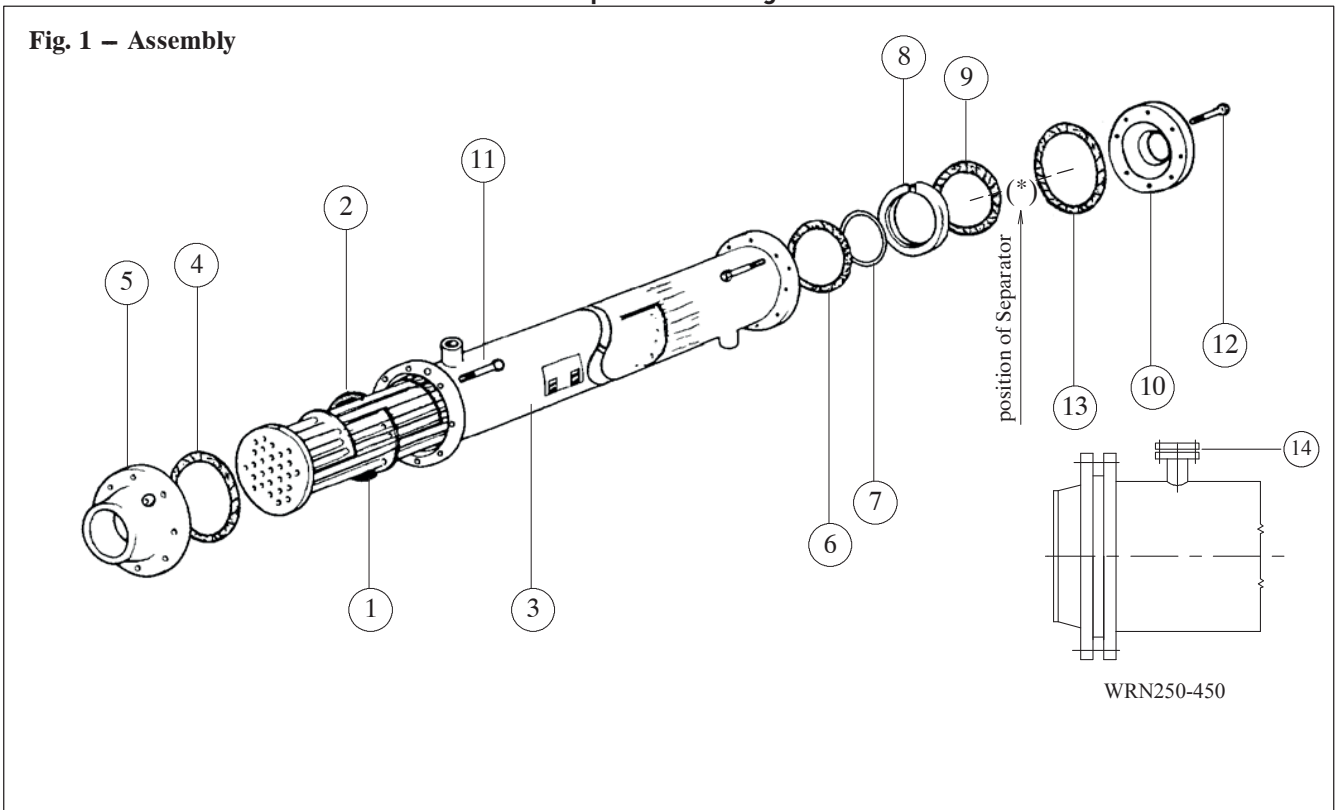
-Cupro Nickel aftercoolers can benefit from being passivated prior to use. Passivation is a one time operation achieved by flowing clean sea water, from open sea, for a minimum of three days to create a protective film on the metal surface. Note that at low sea temperatures the protective film takes longer to form. Cupro Nickel alloys are sensitive to biological agents and pollutants (sulphate reducing bacteria can produce sulphides that can start corrosion and pitting) typically present in harbours, ports and coastal waters and we recommend that for sea water cooling of Cupro Nickel aftercoolers that there is constant water flow through the aftercooler. If the Cupro Nickel aftercooler is typically used on board vessels in port side water or dirty sea water then we recommend flushing the aftercooler with clean sea water as soon as the vessel leaves port and is in open waters as would occur if the water flow is constant as previously recommended. If, however, the installation is permanently in dirty water, for example a harbour installation or a floating station, it is recommended to introduce a clean sea water flush process or to install a secondary hydraulic circuit to ensure that clean water is used through the aftercooler. Verify and clean the aftercooler tube bundle at least quarterly.

-All water-cooled aftercoolers need to be protected against rust or other solid particles entering the cooling water inlet of the aftercooler. Avoid excessive water flow above 2-3 m/s which can damage the compressed air/gas tubes at the water inlet section.

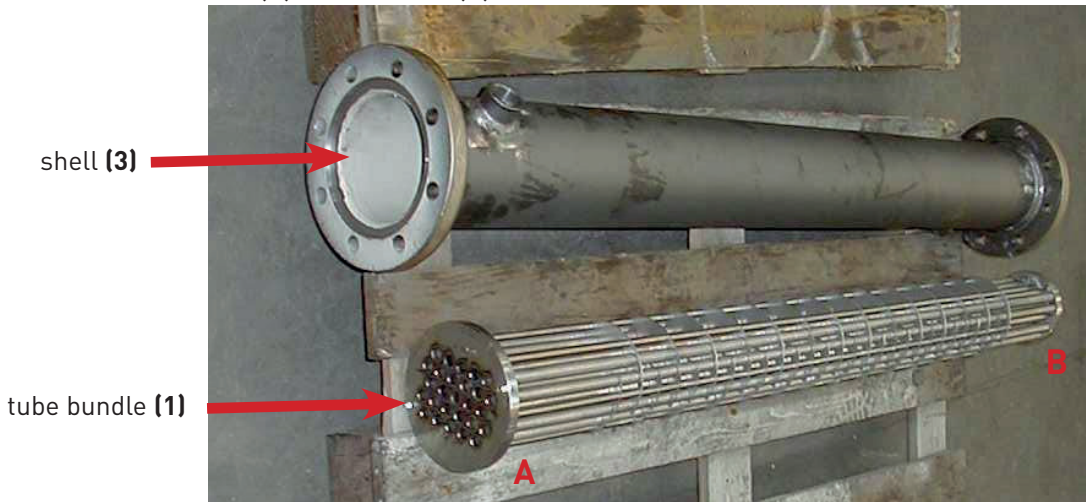
- Avoid too leaving the water side drained of water. For removable tube bundles do not use metallic brushes which can damage the tubes.

How to assembly a WRN

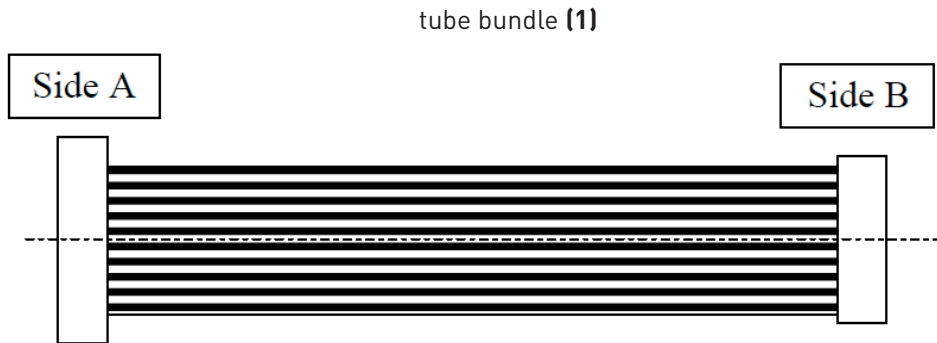
Exploded drawing



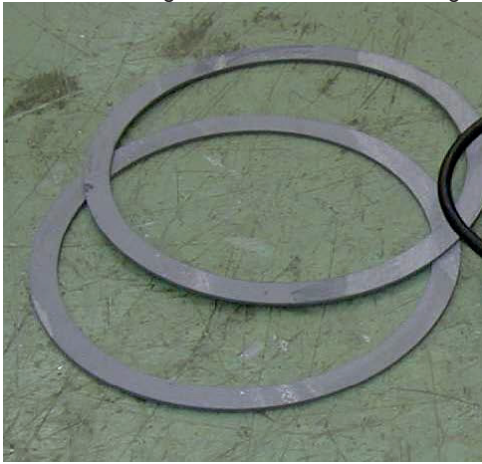
Start with the tube bundle **(1)** and the shell **(3)**



Notice that the diameter of the “mobile” tube sheet for insertion side is smaller (side B)
 This tube sheet and the support ring are in stainless steel (or plated) for all WR models, to assure good coupling of the two parts in any condition.

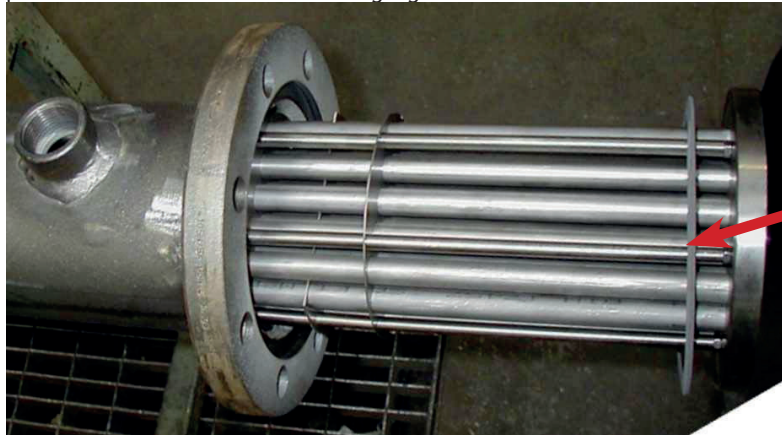


Place the gasket (n. 2) into the groove of the cooler flange. Hold it in place with some grease or oil



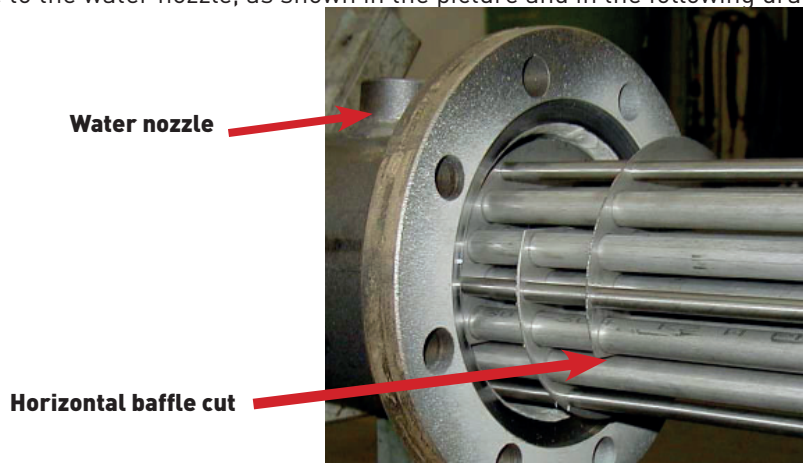
Gasket 2

Insert the tube bundle and push it with care to avoid damaging the baffles



Gasket 2

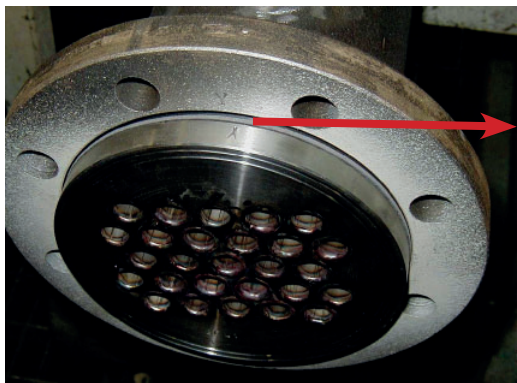
Orient correctly the bundle in order to have the right water flow inside the shell: the final baffle must have the horizontal cut opposite to the water nozzle, as shown in the picture and in the following drawing.



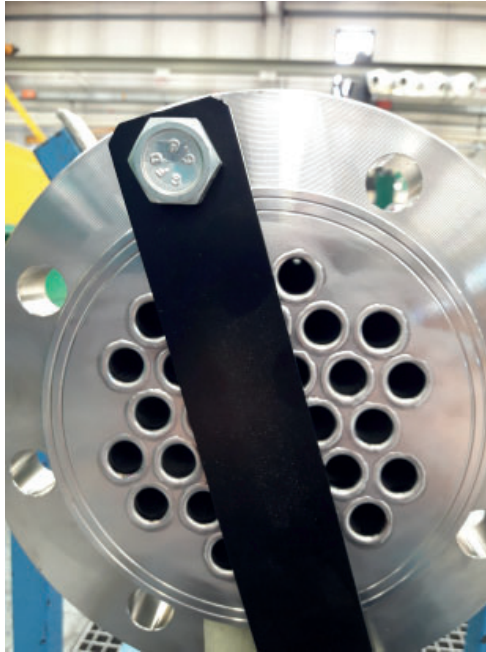
Water nozzle

Horizontal baffle cut

To help with the positioning, there is a mark on the "fixed" tube sheet border and on the flange (usually a Y).



Insert the bundle and push it with care to avoid damaging the baffles.
Fix with the bracket the tube bundle



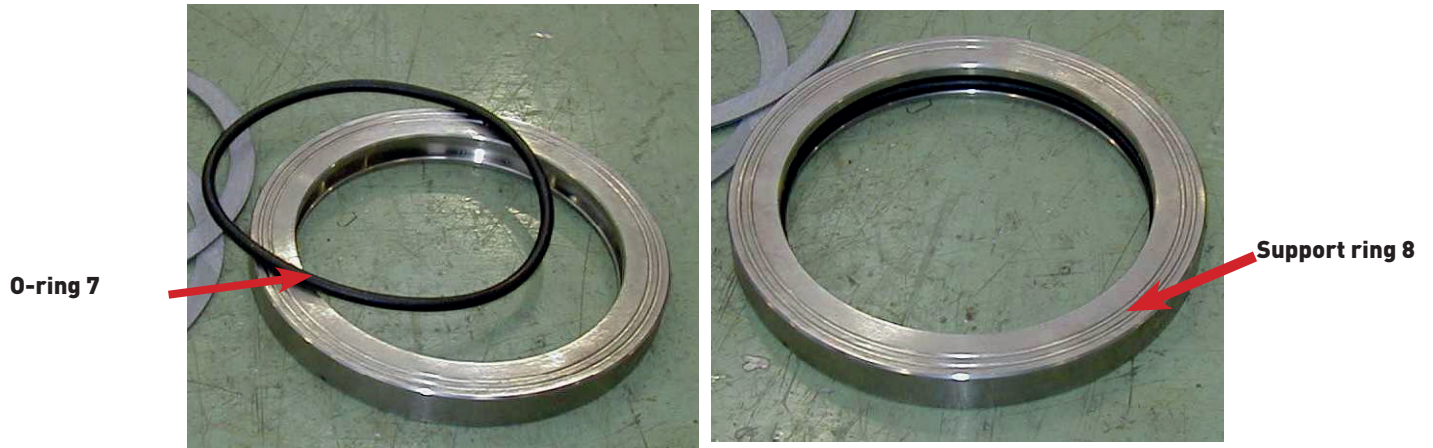
The side A is now completed.
On side B, add the gasket (n. 6)



lubricate the tube sheet to help the insertion



Insert on the support ring (n. 8) the O-ring (n. 7)



Insert the support ring on the vessel and fix.



The side B is now completed.

First aid kit (gasket)

| PMC Order-No | MODEL | 7 | | 2 - 6 | | 4 - 9 | |
|--------------|------------------------|------------|----|----------------------------|----|----------------------------|----|
| | | OR | N° | GASKET | N° | GASKET | N° |
| 398H641800 | WRN/A/C/S 007 +STH013N | 398H241765 | 1 | 398H240105P Øe104 Øi91 | 2 | 398H240105P Øe104 Øi91 | 2 |
| 398H641802 | WRN/AC/S/ 016 +STH021N | 398H241770 | 1 | 398H240145P Øe130 Øi110 | 2 | 398H240155P Øe142 Øi108 | 2 |
| 398H641803 | WRN/A/C/S 028 +STH040N | 398H241775 | 1 | 398H240165P Øe155 Øi135 | 2 | 398H240180P Øe162 Øi133 | 2 |
| 398H641804 | WRN/A/C/S 028 +SFH030N | 398H241775 | 1 | 398H240165P Øe155 Øi135 | 2 | 398H240180P Øe162 Øi133 | 2 |
| 398H641806 | WRN/A/C/S 050 +SFH038N | 398H241785 | 1 | 398H240195P Øe188 Øi170 | 2 | 398H240205P Øe192 Øi159 | 2 |
| 398H641807 | WRN/A/C/S 050 +SFH066N | 398H241785 | 1 | 398H240195P Øe188 Øi170 | 2 | 398H240205P Øe192 Øi159 | 2 |
| 398H641816 | WRN/A/C/S 090 +SFH089N | 398H241795 | 2 | 398H240240P Øe265 Øi247 | 2 | 398H240250P Øe273 Øi248 | 2 |
| 398H641817 | WRN/A/C/S 090 +SFH097N | 398H241795 | 2 | 398H240240P Øe265 Øi247 | 2 | 398H240250P Øe273 Øi248 | 2 |
| 398H641809 | WRN/A/C/S 130 +SFH142N | 398H241800 | 2 | 398H240260P Øe295 Øi276 | 2 | 398H240270P Øe328 Øi273 | 2 |
| 398H641810 | WRN/A/C/S 170 +SFH180N | 398H241810 | 2 | 398H240280P Øe350 Øi327 | 2 | 398H240285P Øe378 Øi326 | 2 |
| 398H641812 | WRN 250 +SFH280N | 398H241820 | 2 | 398H240294P Øe420 Øi365 | 2 | 398H240300P Øe438 Øi357 | 2 |
| 398H641813 | WRN 350 +SFH390N | 398H241821 | 2 | 398H240325P Øe520 Øi450 | 2 | 398H240325P Øe520 Øi450 | 2 |
| 398H641814 | WRN 450 +SFH450N | 398H241822 | 2 | 398H240328P Øe570 Øi520 | 2 | 398H240999P Øe595 Øi520 | 2 |

These are the gaskets insert in the kit but used for the external connections.

| Code Kit | MODEL | 13 | | 14 | |
|------------|------------------------|----------------------------|----|----------------------------|----|
| | | Air connection | | Water connection | |
| | | GASKET | N° | GASKET | N° |
| 398H641800 | WRN/A/C/S 007 +STH013N | - | | | |
| 398H641802 | WRN/AC/S/ 016 +STH021N | - | | | |
| 398H641803 | WRN/A/C/S 028 +STH040N | - | | | |
| 398H641804 | WRN/A/C/S 028 +SFH030N | 398H240155P Øe142 Øi108 | 1 | | |
| 398H641806 | WRN/A/C/S 050 +SFH038N | 398H240180P Øe162 Øi133 | 1 | | |
| 398H641807 | WRN/A/C/S 050 +SFH066N | 398H240205P Øe192 Øi159 | 1 | | |
| 398H641816 | WRN/A/C/S 090 +SFH089N | 398H240225P Øe218 Øi195 | 1 | | |
| 398H641817 | WRN/A/C/S 090 +SFH097N | 398H240250P Øe273 Øi248 | 1 | | |
| 398H641809 | WRN/A/C/S 130 +SFH142N | 398H240245P Øe273 Øi221 | 1 | | |
| 398H641810 | WRN/A/C/S 170 +SFH180N | 398H240245P Øe273 Øi221 | 1 | | |
| 398H641812 | WRN 250 +SFH280N | 398H240245P Øe273 Øi221 | 1 | 398H240135P Øe127 Øi90 | 2 |
| 398H641813 | WRN 350 +SFH390N | 398H240270P Øe328 Øi273 | 1 | 398H240150P Øe142 Øi90 | 2 |
| 398H641814 | WRN 450 +SFH450N | 398H240285P Øe378 Øi326 | 1 | 398H240175P Øe162 Øi108 | 2 |

Fig.1

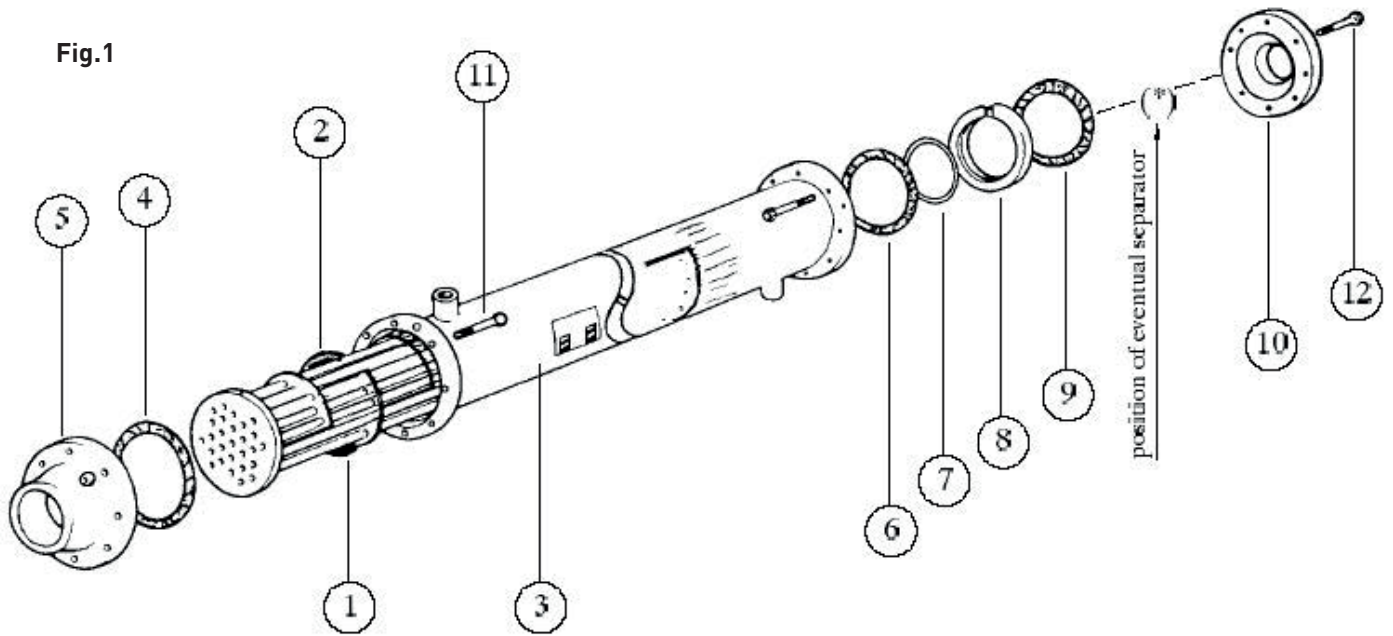
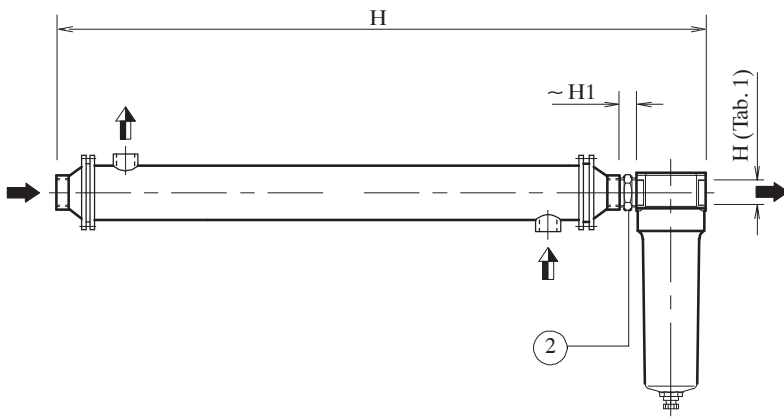
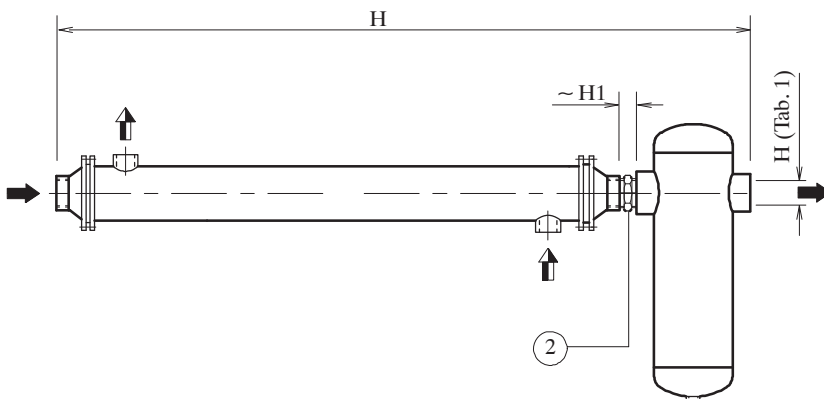


Fig. 3 – Combined Aftercooler (WR*007–028) + Separator (STH)

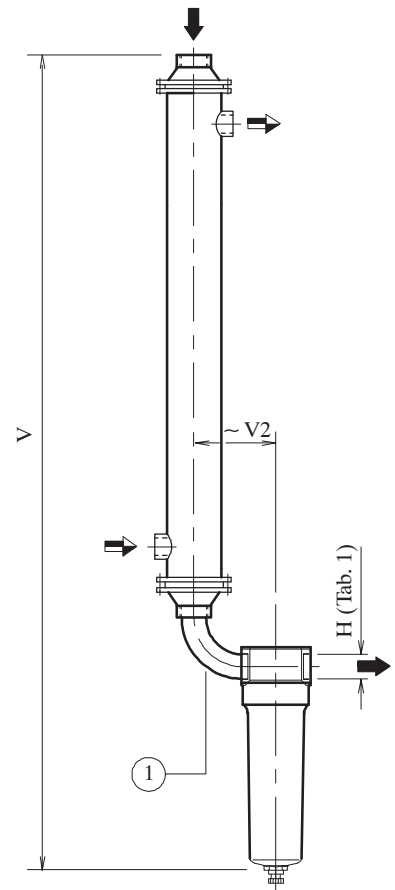
WRN/C/S/A + STH



WRP + STH*P

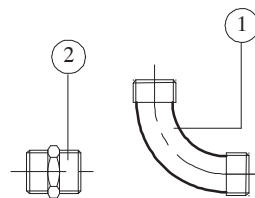


WRN/C/S/A + STH



- ➔ = compressed air flow
- ➔ = cooling water flow

For aftercooler and air/water connection dimensions, see Fig. 2.
For separator dimensions, see respective manual.



| HORIZONTAL | | | | |
|--------------------|-------------------|---------|---------|---------|
| Combination | WRN/C/S/ A+STH | 007+013 | 016+021 | 028+040 |
| dimensions (mm) | H | 1333 | 1654 | 1622 |
| | H1 | 21 | 21 | 25 |
| combination | WRP+STH*P | 003+007 | | |
| dimensions (mm) | H | - | | |
| | H1 | - | | |

| VERTICAL | | | | |
|--------------------|-------------------|---------|---------|---------|
| combination | WRN/C/S/ A+STH | 007+013 | 016+021 | 028+040 |
| dimensions (mm) | V | 1656 | 2118 | 2282 |
| | V2 | 140 | 180 | 234 |

Accessories WRN (sample)

| MODEL | PMC Order-No | Component | | |
|-------------|--------------|---------------------------|----|----------------|
| | | descripton | n° | drawing refer |
| WRN-C-S 007 | 398H649151 | bolt M16X70ST | 8 | fig.1 11/12 |
| | | half sleeve 1.1/2"MM BSPT | 2 | - |
| | | reduction PN 16 DN50 | 2 | fig.1 5/10 |
| | | gasket Øe104 Øi91 | 2 | fig.1 4/9 |

Accessories WRN+SFH (sample)

| MODEL | PMC Order-No | Component | | |
|-------------------------|--------------|---------------------------|----|----------------|
| | | descripton | n° | drawing refer |
| WRN-C-S 007 +STH013N | 398H641251 | bolt M16X70ST | 8 | fig.1 11/12 |
| | | half sleeve 1.1/2"MM BSPT | 2 | - |
| | | reduction PN 16 DN50 | 2 | fig.1 5/10 |
| | | curve 90° 1.1/2"MM BSPT | 1 | fig.3 1 |
| | | nipples 1.1/2"MM BSPT | 1 | fig.3 2 |
| | | gasket Øe104 Øi91 | 2 | fig.1 4/9 |

Accessories

| MODEL | PMC Order-No: WRN | Separator | cPMC Order-No: WRN-STH |
|-------------|-------------------|-----------|------------------------|
| WRN-C-S 007 | 398H649151 | STH013N | 398H641251 |
| WRN-C-S 016 | 398H649251 | STH021N | 398H641253 |
| WRN-C-S 028 | 398H649350 | STH040N | 398H641254 |

Fig. 1 – Assembly

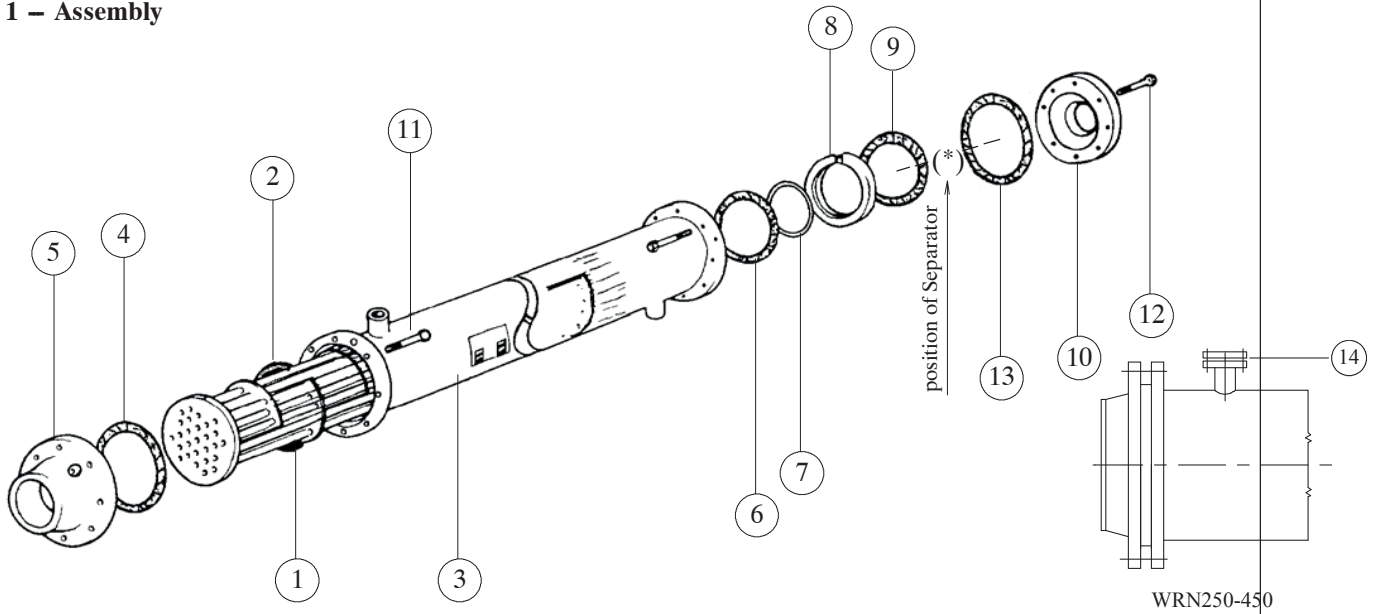
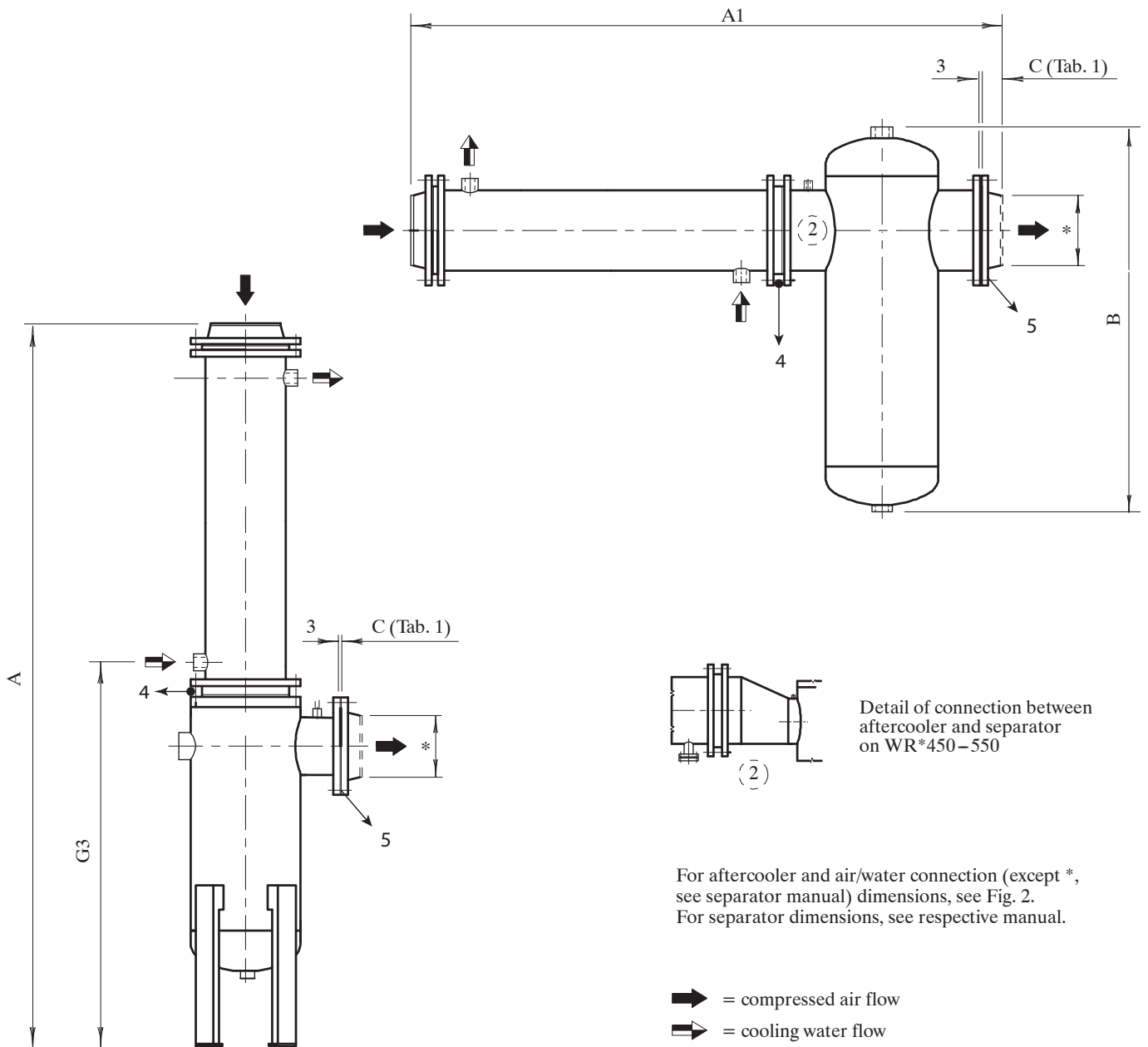


Fig. 4 – Combined Aftercooler WBC-200RH - WBC-550RH + Separator SFH/SFV



| HORIZONTAL | | | | | | | | | | |
|--------------------|------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| combination | WRN/C/ S/A + SFH | 028 + 030 | 050 + 066 | 090 + 089 | 130 + 142 | 170 + 180 | 250 + 280 | 350 + 390 | 450 + 450 | 550 + 550 |
| dimensions (mm) | A1 | 1804 | 1962 | 1989 | 2112 | 2182 | 2632 | 2844 | 3588 | 3705 |
| | B | 720 | 980 | 1060 | 1255 | 1455 | 1745 | 2154 | 2355 | 2835 |

| HORIZONTAL | | | | | |
|--------------------|----------------|--------------|--------------|--------------|--------------|
| combination | WRP + SFH*P | 016 + 029 | 028 + 037 | 050 + 066 | 090 + 097 |
| dimensions (mm) | A1 | 1883 | 1869 | 1965 | 2089 |
| | B | 705 | 865 | 949 | 1130 |

| VERTICAL | | | | | | |
|--------------------|------------------------|--------------|--------------|--------------|--------------|--------------|
| combination | WRN/C/ S/A + SFV | 028 + 037 | 050 + 066 | 090 + 097 | 130 + 142 | 170 + 180 |
| dimensions (mm) | A | 2457 | 2543 | 2721 | 2824 | 3007 |
| | G3 | 1179 | 1259 | 1431 | 1528 | 1710 |

Accessories WRN (sample)

| MODEL | PMC Order-No | Component | | |
|-------------|--------------|-------------------------|----|----------------|
| | | description | n° | drawing refer |
| WRN-C-S 028 | 398H649350 | bolt M16X80ST | 16 | fig.1 11/12 |
| | | reduction PN16 DN100/NW | 2 | fig.1 5/10 |
| | | gasket Øe162 Øi133 | 2 | fig.1 4/9 |

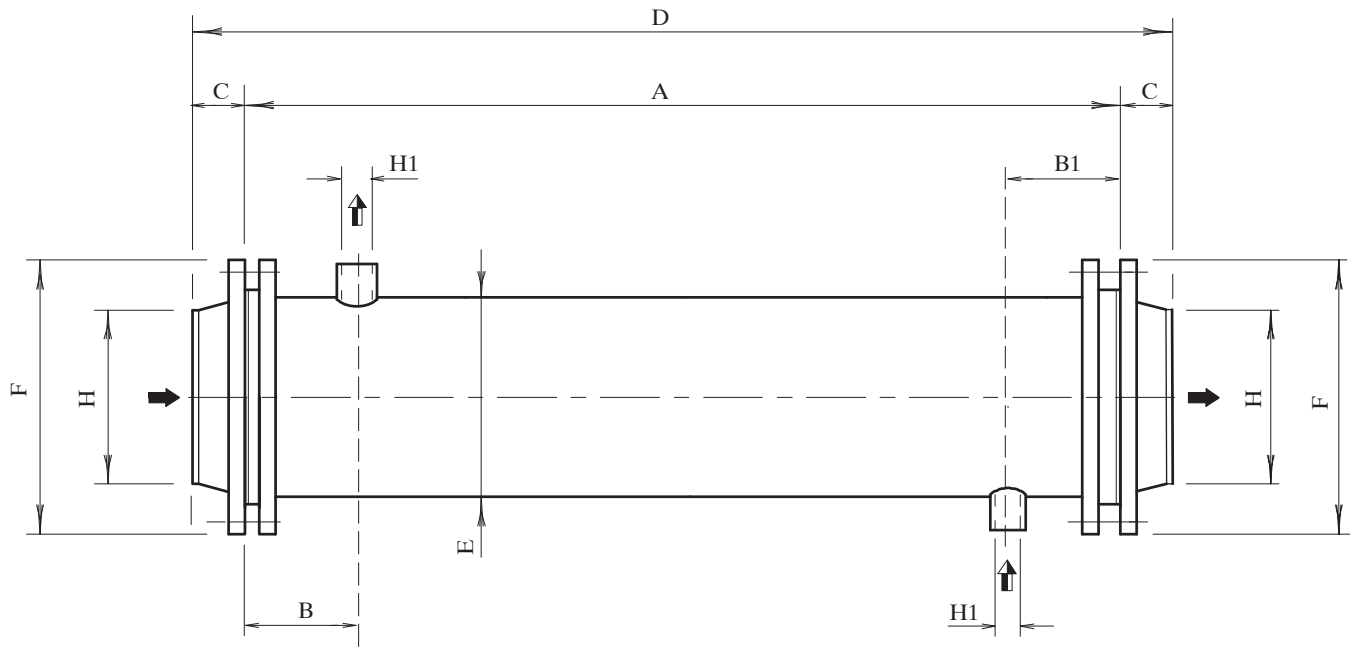
Accessories WRN+SFH (sample)



| MODEL | PMC Order-No | Component | | |
|-------------------------|--------------|-------------------------|----|----------------|
| | | description | n° | drawing refer |
| WRN-C-S 028 +SFH030N | 398H641352 | bolt M16X80ST | 16 | fig.1 11/12 |
| | | gasket Øe104 Øi91 | 2 | fig.1 4/9 |
| | | reduction PN16 DN100/NW | 1 | fig.1 5 |
| | | bolt M16X70ST | 8 | fig.4 4 |
| | | gasket Øe142 Øi108 | 1 | fig.1 13 |
| | | flange PN16 DN 80 | 1 | fig.1 10 |

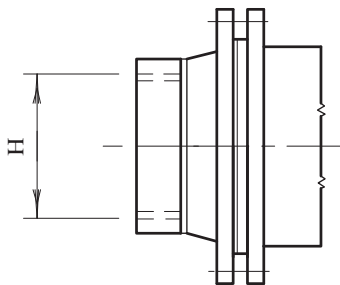
Accessories

| MODEL | PMC Order-No: WRN | Separator | PMC Order-No: WRN-STH |
|-------------|-------------------|-----------|-----------------------|
| WRN-C-S 028 | 398H649350 | SFH030N | 398H641352 |
| WRN-C-S 050 | 398H649450 | SFH066N | 398H641450 |
| WRN-C-S 090 | 398H649550 | SFH089N | 398H641358 |
| WRN-C-S 130 | 398H649600 | SFH142N | 398H641600 |
| WRN-C-S 170 | 398H649650 | SFH180N | 398H641650 |
| WRN-C-S 250 | 398H649702 | SFH280N | 398H641703 |
| WRN-C-S 350 | 398H649703 | SFH390N | 398H641704 |
| WRN-C-S 450 | 398H649704 | SFH450N | 398H641705 |
| WRN-C-S 550 | 398H649705 | SFH550N | 398H641706 |

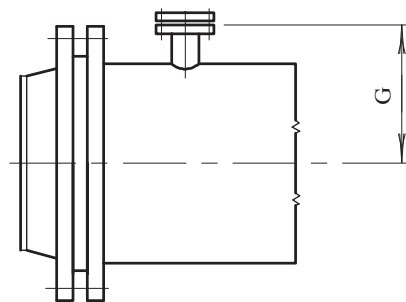
Fig. 2 – Aftercooler overall dimensions



 = compressed air flow
 = cooling water flow



Detail of WR*007-016,
showing threaded air connection.



Detail of WR*250-550,
showing flanged water connection.

Tab. 1 - Aftercooler characteristics

| MODEL | dimensions (Fig. 2 - mm) | | | | | | | | inlet/outlet connections (Fig. 2) | | weight (kg) | | | volume (dm ³) | | pressure (bar) | | | | | | | | | |
|--------|-----------------------------|-----|-----|----|------|-----|-----|-----|---|---------------------|--------------------|------|-----|------------------------------|-------|-------------------|----|------|---------------|----------------------|--------------|------|------|------|------|
| | A | B | B1 | C | D | E | F | G | air (H) | water (H1) | WRN/WRS WRC/WRA | WRP | air | water | air | wa- ter | | | | | | | | | |
| WR*007 | 1049 | 72 | 77 | 77 | 1003 | 89 | 165 | - | thre. (BSP) | PN16 DN50 | 1/2" | 26 | - | 1.5 | 3.5 | 16 | | | | | | | | | |
| WR*016 | 1299 | 122 | 127 | 92 | 1483 | 108 | 200 | - | | PN16 DN80 | | | | | | | | 3/4" | 46 | - | 3.0 | 8.0 | | | |
| WR*028 | 1299 | 122 | 127 | 54 | 1409 | 133 | 220 | - | flanged (PN16=UNI2281-67, PN10=2281-67) | PN16 DN100 | threaded (BSP) | 1" | 64 | - | 4.5 | 9.5 | 12 | | | | | | | | |
| WR*050 | 1299 | 123 | 126 | 58 | 1415 | 169 | 250 | - | | PN16 DN125 | | | | | | | | | 1 1/4" | 84 | - | 8.0 | 14.5 | | |
| WR*090 | 1299 | 117 | 133 | 65 | 1429 | 239 | 340 | - | | PN16 DN200 | | | | | | | | | 1 1/4" | 183 | - | 16.0 | 32.0 | | |
| WR*130 | 1299 | 116 | 133 | 71 | 1441 | 273 | 395 | - | | PN10 DN250 | | | | | | | | | 1 1/2" | 224 | - | 22.0 | 38.5 | 10 | |
| WR*170 | 1299 | 116 | 133 | 71 | 1441 | 324 | 445 | - | | PN10 DN300 | | | | | | | | | 2" | 280 | - | 31.0 | 55.5 | | |
| WR*250 | 1499 | 196 | 203 | 71 | 1641 | 375 | 505 | 300 | | flanged (EN 1092-1) | | | | | | | | | PN16 DN350 | threaded (EN 1092-1) | PN16 DN65 | 400 | - | 59.0 | 87.0 |
| WR*350 | 1499 | 148 | 151 | 75 | 1649 | 450 | 615 | 350 | PN10 DN450 | | PN16 DN80 | 585 | - | 91.5 | 126.0 | | | | | | | | | | |
| WR*450 | 1499 | 199 | 200 | 78 | 1655 | 523 | 670 | 375 | PN10 DN500 | | PN16 DN100 | 690 | - | 125.0 | 293.0 | | | | | | | | | | |
| WR*550 | 1500 | 225 | 226 | 82 | 1669 | 580 | 780 | 475 | PN10 DN600 | | PN16 DN100 | 1020 | - | 155.0 | 200.0 | | | | | | | | | | |
| WRP007 | 1049 | 72 | 77 | 77 | 1203 | 89 | 165 | - | thre. (BSP) | PN16 DN50 | 1/2" | - | 28 | 1.5 | 3.5 | | | | | | | | | | |
| WRP016 | 1299 | 122 | 127 | 60 | 1483 | 108 | 200 | - | | PN40 DN80 | | | | | | | | 3/4" | - | 50 | 3.0 | 8.0 | | | |
| WRP028 | 1299 | 122 | 127 | 68 | 1409 | 133 | 235 | - | flanged (UNI 6084-67) | PN40 DN100 | threaded (BSP) | 1" | - | 66 | 4.5 | 9.5 | 40 | 10 | | | | | | | |
| WRP050 | 1299 | 123 | 126 | 71 | 1415 | 169 | 270 | - | | PN40 DN125 | | | | | | | | | 1 1/4" | - | 88 | 8.0 | 14.5 | | |
| WRP090 | 1299 | 117 | 133 | 90 | 1429 | 239 | 375 | - | | PN40 DN200 | | | | | | | | | 1 1/4" | - | 190 | 16.0 | 32.0 | | |

Tab. 2 - Nominal/minimum Thickness

| MODEL | Nom. thickness mm | Min. thickness mm |
|--------|-------------------|-------------------|
| WRN007 | 3.2 | 1.8 |
| WRN016 | 3.6 | 2.2 |
| WRN028 | 4.0 | 2.6 |
| WRN050 | 4.5 | 3.1 |
| WRN090 | 6.3 | 4.9 |
| WRN130 | 6.3 | 4.9 |
| WRN170 | 4.0 | 2.6 |
| WRN250 | 5.0 | 3.6 |
| WRN350 | 5.0 | 3.6 |
| WRN450 | 5.0 | 3.6 |
| WRN550 | 5.0 | 3.6 |

| MODEL | Nom. thickness mm | Min. thickness mm |
|--------|-------------------|-------------------|
| WRS007 | 3.2 | 1.8 |
| WRS016 | 3.6 | 2.2 |
| WRS028 | 4.0 | 2.6 |
| WRS050 | 4.5 | 3.1 |
| WRS090 | 6.3 | 4.9 |
| WRS130 | 6.3 | 4.9 |
| WRS170 | 4.0 | 2.6 |

| MODEL | Nom. thickness mm | Min. thickness mm |
|--------|-------------------|-------------------|
| WRA007 | 2.0 | 1.6 |
| WRA016 | 3.0 | 2.6 |
| WRA028 | 3.0 | 2.6 |
| WRA050 | 2.8 | 2.4 |
| WRA090 | 3.0 | 2.6 |
| WRA130 | 5.0 | 4.6 |
| WRA170 | 4.0 | 3.6 |


| MODEL | Nom. thickness mm | Min. thickness mm |
|--------|-------------------|-------------------|
| WRP007 | 3.2 | 1.8 |
| WRP016 | 3.6 | 2.2 |
| WRP028 | 4.0 | 2.6 |
| WRP050 | 4.5 | 3.1 |
| WRP090 | 6.3 | 4.9 |

Safety instructions

Important:

Keep this manual with the unit throughout its entire service life; Carefully read this manual before carrying out any operation on the unit;

 Do not exceed the design limits given on the dataplate.

 The safety devices on the compressed air circuit must be provided for by the user.

Before starting any maintenance operations, make sure that the circuits are not under pressure.

Only use the unit for professional work and for its intended purpose.

The user is responsible for analysing the application aspects for product installation, and following all the applicable industrial and safety standards and regulations contained in the product instruction manual or other documentation supplied with the unit.

Tampering or replacement of any parts by unauthorised personnel and/or improper machine use exonerate the manufacturer from all responsibility and invalidate the warranty.

The manufacturer declines and present or future liability for damage to persons, things and the machine, due to negligence of the operators, non-compliance with all the instructions given in this manual, and non-application of current regulations regarding safety of the system.

The manufacturer declines any liability for damage due to alterations and/or changes to the packing.

It is the responsibility of the user to ensure that the specifications provided for the selection of the unit or components and/or options are fully comprehensive for the correct or foreseeable use of the machine itself or its components.

When requesting technical assistance or ordering spare parts, always quote the model and serial number on the identification plate mounted externally on the unit.

IMPORTANT: The manufacturer reserves the right to modify this manual at any time.

For the most comprehensive and updated information, the user is advised to consult the manual supplied with the unit.

Introduction

Foreword

Read this manual carefully to ensure that you install and operate this unit correctly.

Transport / Handling

- Do not leave the unit in the open air.
- Use lifting equipment of suitable capacity to lift and move the unit (fork lift etc.).
- Protect the unit from impact to prevent damage to internal components.
- The manufacturer assumes no liability for damages
- Which may be caused by decayed or modified packaging.

Inspection

As soon as you receive the unit, check its condition; **if you notice any damage inform the carrier immediately.**

Assembly (see Fig. 1)

N.B.: For flanged models, if the optional counterflanges/gaskets kit has not been acquired these must be supplied by the user.

Aftercooler with separator STH

Screw the separator onto the aftercooler outlet using the threaded curve (1-Fig. 3) or nipple (2-Fig. 3).

Aftercooler with separator SFH/SFV

- a) Attach gasket (2) and counterflange (3) to the aftercooler's (1) air inlet using the bolts (6).
- b) Attach gasket (4) to the aftercooler's (1) air outlet and then mount it (horizontally or vertically) to the separator, as described in the separator manual (*) in Fig. 1 shows position of separator.
- c) Attach gasket (8) and counterflange (5) to the separator's outlet using the bolts (7).

N.B.: Connect the optional thermometer (if supplied - for position see separator manual) only after the apparatus has been installed (to avoid damage).

Make sure that the flanges are parallel before tightening the flange bolts.

Aftercooler without separator

- a) Attach gasket (2) and counterflange (3) to the aftercooler's (1) air inlet using the bolts (6).
- b) Attach gasket (4) and counterflange (5) to the aftercooler's (1) air outlet using the bolts (7).

Installation (see Fig. 2,3,4)

- a) Do not install the unit in the open air.
Install the unit only in environments which ensure an ambient temperature within the range specified on the data plate. These limits must be observed in all cases.
- b) Support the unit on suitable mountings.
- c) **Install one or more safety valves as necessary on the air/gas side to ensure that maximum design pressure is never exceeded. These valves must be fitted in such a way that there is no risk of any expelled fluid coming into contact with operators.**
- d) If the pressurised fluid circuit is subject to vibration, use flexible hoses and vibration dampers to connect up the unit, or secure the circuit more firmly to eliminate the vibrations. If the circuit is subject to pressure pulses of more than 10% rated pressure, install a pulse damper to reduce them to below this level.
The number of cycles at nominal pressure 0 must be less than 1000 over the lifetime of the machine.
- e) Make sure that the air around the unit does not contain contaminating solids or gases. Compressed and condensed gases can react to produce acids and other chemicals which could damage the unit.
Take particular care with sulphur, ammonia, chlorine and installations in marine environments. For further advice or assistance consult the manufacturer.
- f) Support the air/gas inlet and outlet pipes if they strain the connection ports and/or flanges.
- g) If the unit is installed in a seismic zone, install suitable devices to protect against seismic activity.
- h) Install fire-prevention and fire-fighting equipment suitable for the area in which the unit is installed in order to protect it against fire.

i) If operating temperature exceeds 60°C, fit any protective guards necessary to prevent accidental contact and burns.

RESPECT THE DIRECTION OF THE AIR/WATER INLET AND OUTLET LABELS.

AIR/GAS CONNECTIONS: Attach the compressed air piping to the threaded / flanged connections on the apparatus (if non-standard flanges are used, ensure that their internal diameter allows a free air passage to all the aftercooler's tubes).

The apparatus must be installed immediately down-stream of the compressor, and with the separator down-stream of the aftercooler.

WATER CONNECTIONS: Attach the cooling water piping to the aftercooler's threaded/flanged connections.

Ensure the following:

- The water inlet must always be below the water outlet (to maximize performance and allow water to drain out when idle).
- The water must drain away freely (to prevent water entering the compressed air tubing in the event of a fracture).
- For closed water circuits, ask for separate instructions and install a safety valve (set at a pressure below the maximum safe pressure of the weakest point in the circuit).
- Guarantee a constant water flow and install a water flow detector (eg. visible discharge to drain, sight glass, etc.) or an automatic compressor shut-down device.

Operation and maintenance

Maintenance must only be performed by specialist personnel.

FOR SEPARATOR SEE RESPECTIVE MANUAL.

The temperature of incoming fluids, must never exceed the maximum value specified on the data plate. If temperatures exceed the specified values, contact the manufacturer for further information.

Avoid subjecting the unit to thermal stress caused by repeated fluctuations in incoming fluid temperature.

To guarantee optimum operation, ensure that the maintenance program below is performed regularly, and that the following rules are respected:

- Ensure a constant water flow.
- Respect the fluid temperatures specified at the time of purchase of the unit; if this is not possible, contact the manufacturer for further information.
- Avoid rapid scaling by keeping the water outlet temperature as low as possible.
- Drain all water out of the aftercooler when it is not in operation (to prevent ice formation).

Maintenance program

AIR/GAS CIRCUIT

frequency: Every 1000-8000 hours of operation, depending on air quality and compressor type.

operation: Remove the carbon, tars and dust, formed on the insides of the aftercooler's tubes, using suitable solvents. Afterwards thoroughly dry the insides of the tubes using compressed air.

Check for signs of corrosion, in which case contact the authorised inspector or the supplier for authorisation to continue using the unit.

WATER CIRCUIT

frequency: After 1000-1200 hours of operation, and thereafter as appropriate according to the degree of encrustation (ie. the water hardness and temperature).

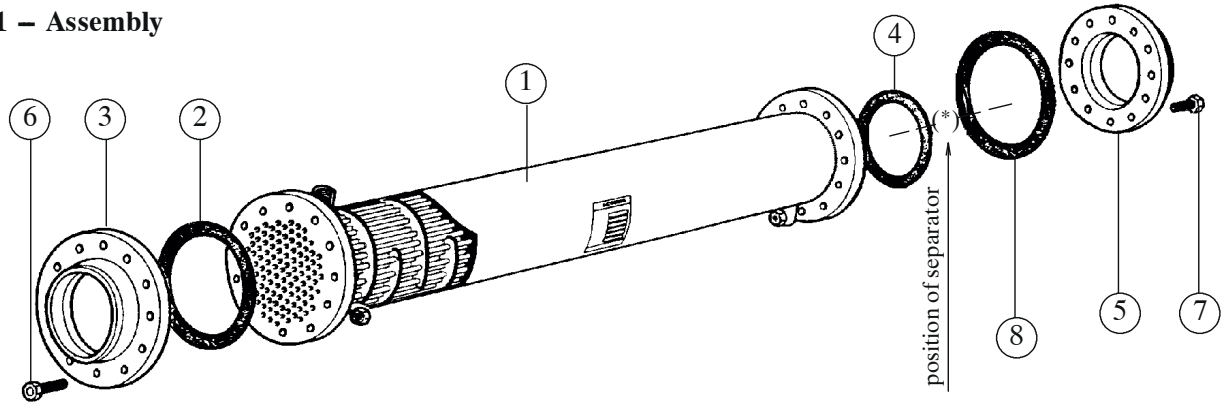
operation: Connect a pump to the aftercooler's water inlet and outlet and then clean the circuit by pumping through a chemical descaler. Afterwards rinse by pumping through with water.

ALWAYS CLEAN IN THE OPPOSITE DIRECTION TO THE COOLING WATER FLOW.

NOTE: It is advised to stock a spare set of gaskets.

Exploded drawing

Fig. 1 – Assembly



Accessories WFN (sample)

| MODEL | PMC Order-No | Component | | |
|---------|--------------|-------------------------|----|---------------|
| | | description | n° | drawing refer |
| WFN 027 | 398H648600 | bolt M16X60ST | 16 | fig.1 6/7 |
| | | reduction PN16 DN100/NW | 2 | fig.1 3/5 |
| | | gasket Øe162 Øi133 | 2 | fig.1 2/8 |

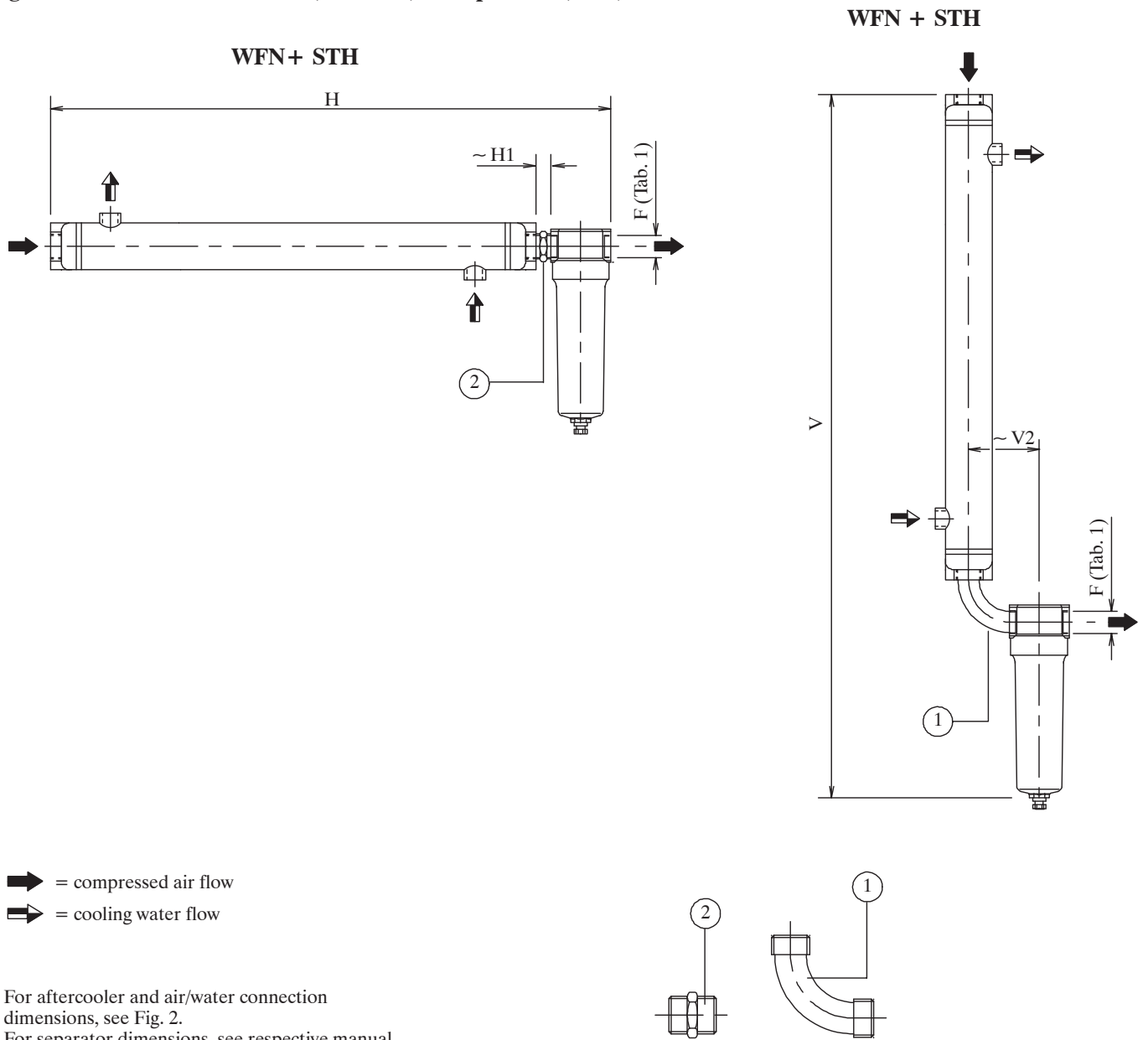
Accessories WFN+SFH (sample)

| MODEL | PMC Order-No | Component | | |
|--------------------|--------------|----------------------------|----|----------------|
| | | description | n° | drawing refer |
| WFN 027 +STH040 | 398H640201 | bolt M16X80ST | 16 | fig.1 11/12 |
| | | reduction PN16 DN100-2.1/2 | 2 | fig.1 3/5 |
| | | gasket Øe162 Øi133 | 2 | fig.1 2/8 |
| | | curve 90- 2 1/2"MM BSPT | 1 | fig.3 1 |
| | | nipples 2.1/2" MM | 1 | fig.3 2 |

Accessories

| MODEL | PMC Order-No: WFN | Separator | PMC Order-No: WFN-STH/SFH |
|---------|-------------------|-----------|---------------------------|
| WFN 009 | - | STH021N | 398H640430 |
| WFN 027 | 398H648600 | STH040N | 398H640201 |
| | | SFH030N | 398H640101 |
| WFN 050 | 398H648700 | SFH066N | 398H640700 |
| WFN 090 | 398H648800 | SFH089N | 398H640104 |

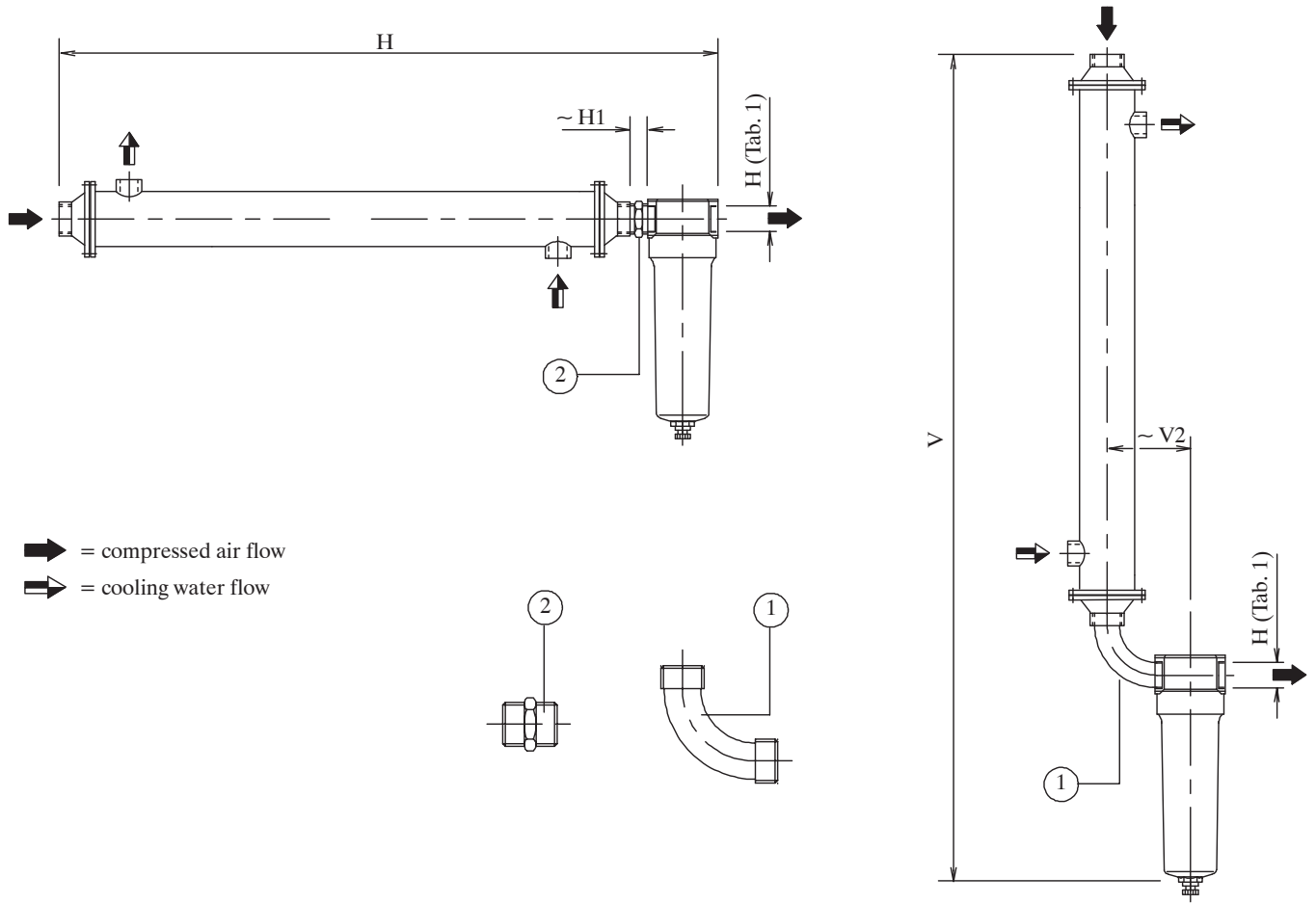
Fig. 3 – Combined Aftercooler (WFN009) + Separator (STH)



| HORIZONTAL | | |
|------------------------|----------------|----------------|
| combination | WFN+STH | 009+021 |
| dimensions (mm) | H | 1191 |
| | H1 | 21 |

| VERTICAL | | |
|------------------------|----------------|----------------|
| combination | WFN+STH | 009+021 |
| dimensions (mm) | V | 1675 |
| | V2 | 180 |

Fig. 3 – Combined Aftercooler (WFN027) + Separator (STH)

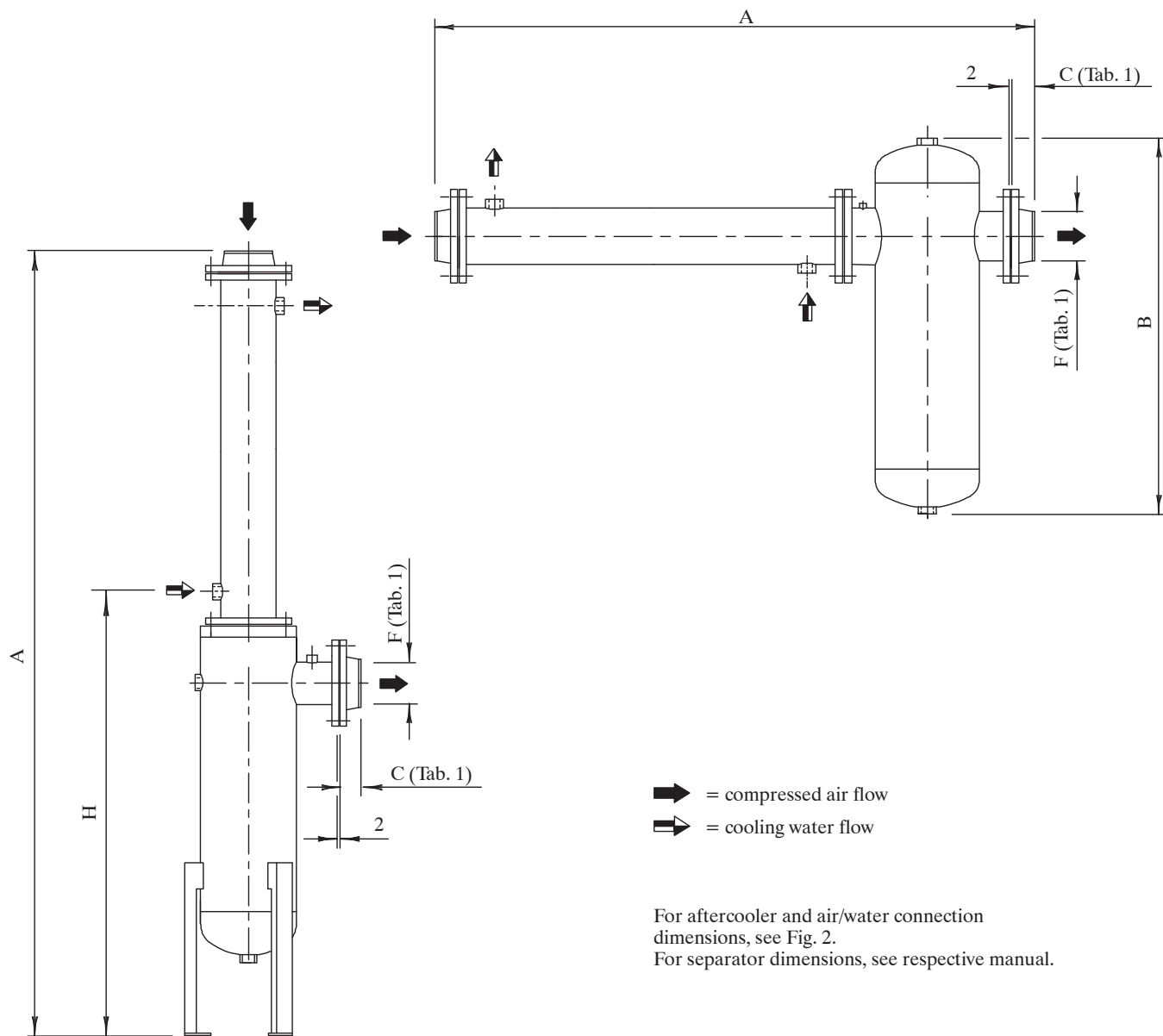


For aftercooler and air/water connection dimensions, see Fig. 2.
 For separator dimensions, see respective manual.

| HORIZONTAL | | |
|-----------------|----------|-----------|
| combination | WFN +STH | 027 + 040 |
| dimensions (mm) | A1 | 1221 |
| | B | 25 |

| VERTICAL | | |
|-----------------|----------|-----------|
| combination | WFN +STH | 027 + 040 |
| dimensions (mm) | A1 | 1881 |
| | B | 234 |

Fig. 4 – Combined Aftercooler (WFN050–090) + Separator (SFH/SFV)

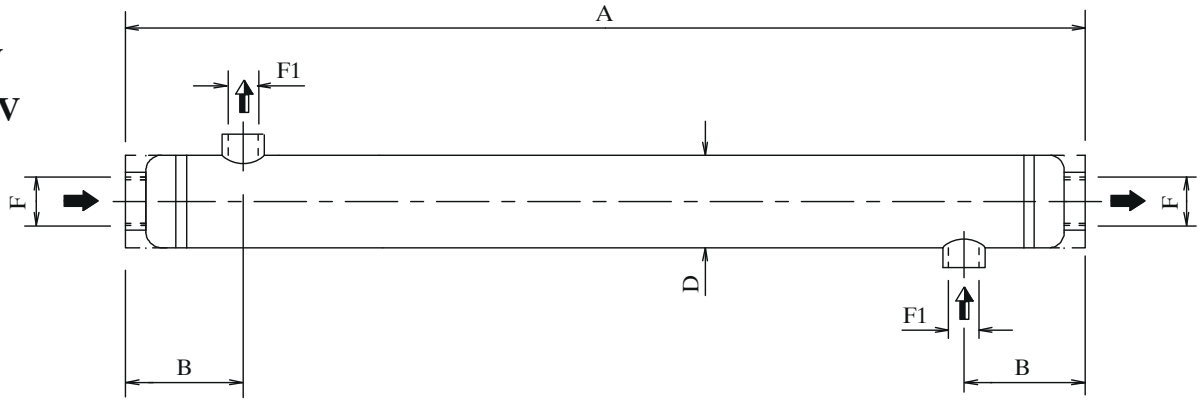


| HORIZONTAL | | | |
|-----------------|----------|-----------|-----------|
| combination | WFN +SFH | 050 + 066 | 090 + 089 |
| dimensions (mm) | A | 1963 | 1990 |
| | B | 980 | 1060 |

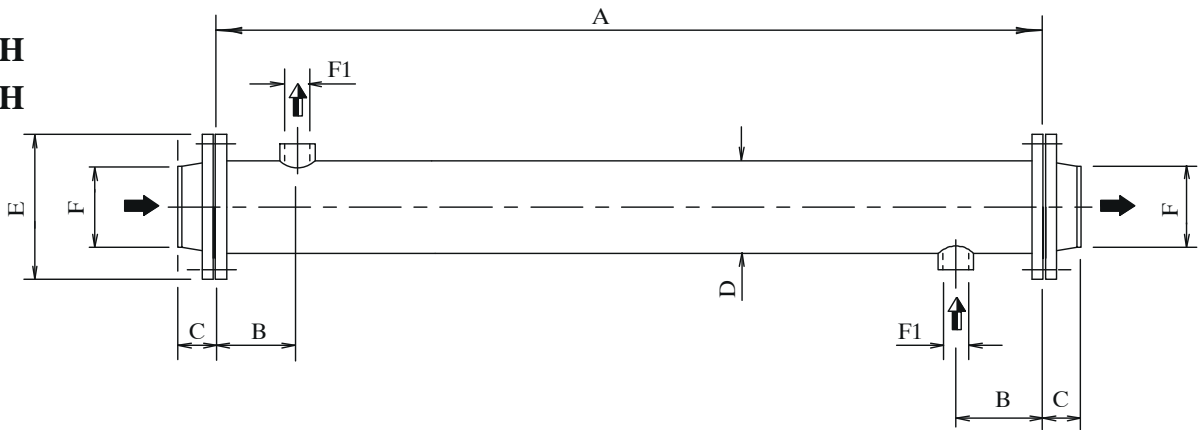
| HORIZONTAL | | | |
|-----------------|----------|-----------|-----------|
| combination | WFN +SFV | 050 + 066 | 090 + 097 |
| dimensions (mm) | A | 2247 | 2722 |
| | H | 1234 | 1398 |

Fig. 2 – Aftercooler overall dimensions

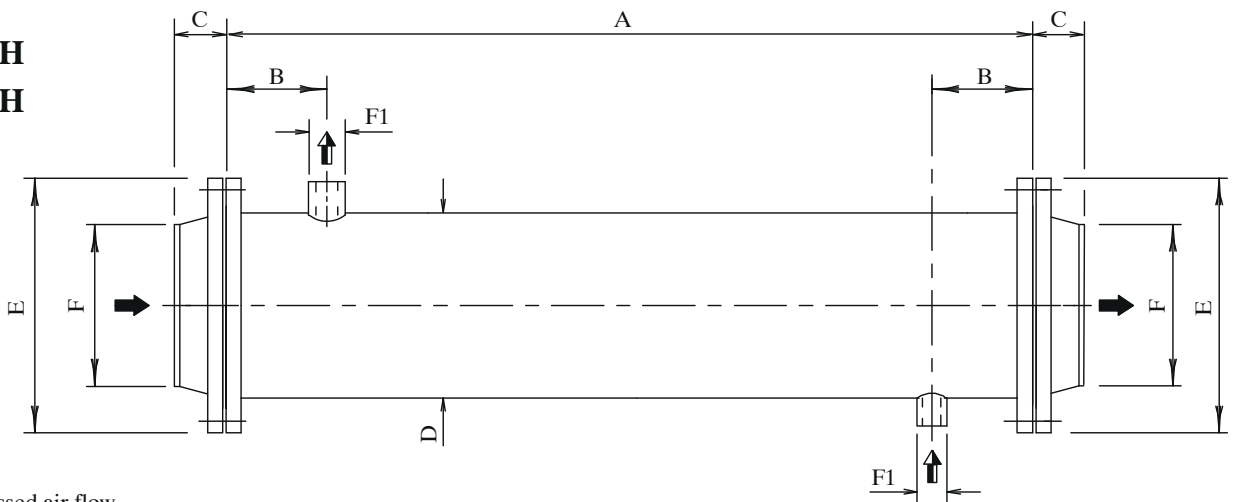
WBC-12FH/V
WBC-135FH/V



WBC-180FH
WBC-360FH



WBC-500FH
WBC-900FH



➡ = compressed air flow
⇄ = cooling water flow

Tab. 1 - Aftercooler characteristics

| MODEL | dimensions (Fig. 2 - mm) | | | | | inlet/outlet connections (Fig. 2) | | | | weight (kg) | volume (dm3) | | pressure (bar) | | |
|--------|-----------------------------|-----|----|-----|-----|--------------------------------------|------------|---------------|--------|----------------|-----------------|-------|-------------------|-------|----|
| | A | B | C | D | E | air (F) | | water (F1) | | | air | water | air | water | |
| WFN009 | 1020 | 105 | - | 76 | - | flanged (UNI2282-67) | 2" (BSP) | | 3/4" | | 10.5 | 1.0 | 2.50 | 16 | 10 |
| WFN027 | 900 | 115 | 54 | 133 | 220 | | PN16 DN100 | | 1 1/4" | | 28 | 3.0 | 8.00 | 12 | |
| WFN050 | 1300 | 100 | 58 | 168 | 250 | | PN16 DN125 | | 1 1/4" | | 84 | 8.0 | 14.50 | 12 | |
| WFN090 | 1300 | 100 | 65 | 239 | 340 | | PN16 DN200 | | 1 1/4" | | 143 | 16.0 | 32.0 | 12 | |



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