



# Manual

## Flow heat exchanger DWR

Ausgabe: 04.05.2017

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**Please read this manual carefully before installing, commissioning or operating the high-pressure vessel.**

### 1. INTENDED USE

WITT flow heat exchangers DWR are solely designed for use in refrigeration systems to evaporate residue refrigerant from a refrigerant/oil mixture.

### 2. SAFETY REQUIREMENTS

Any work with refrigeration systems must be carried out by trained personal. All safety regulations concerning prevention of accidents or use of refrigerants must be adhered to.

Applicable standards and regulations for installing or operating refrigeration plants, e.g. EN 378 must be adhered to.

Under no circumstances are the indicated temperature- and pressure limitations on the data plate to be exceeded!



It is not allowed to isolate the flow heatexchanger DWR from other parts of the refrigeration system. Should system design allow this situation a pressure release according to EN 378 must be installed.



Any welding to the DWR (except to the intended connections) is prohibited or this will void the certificates.

Before commissioning make sure all safety equipment has been checked and works properly. Any safety equipment must be retested after disassembly or activation.

### 3. TERMS OF WARRANTY

To prevent accidents and for the safe operation of the refrigerant plant no modifications or alterations may be carried out to the flow heat exchanger DWR without written approval by TH. WITT Kältemaschinenfabrik GmbH.

All information for the safe operation and maintenance of flow heat exchanger DWR is based on our experience and is to the best of our knowledge.

**Our liability or warranty is excluded, if:**

- The instructions in this manual are not adhered to
- The flow heat exchanger DWR and its equipment was operated incorrectly or the handling was not in accordance with the mentioned procedures
- The flow heat exchanger DWR is used for purposes other than that for which it was intended to
- Safety devices were not used or disconnected
- There have been modifications made without written approval
- During installation or operation the safety requirements were not adhered to
- beim Betrieb des DWR einschlägige Sicherheitsbestimmungen und Unfallverhütungsvorschriften nicht beachtet werden.

### 4. SCOPE OF DELIVERY

**Standard scope of supply:**

- Flow heat exchanger DWR with connections for hot gas, for refrigerant/oil mixture and connection for an oil filter.

**Optional scope of supply**

- Other components for WITT oil return system WOR
- Oil filter ÖF G1/4"



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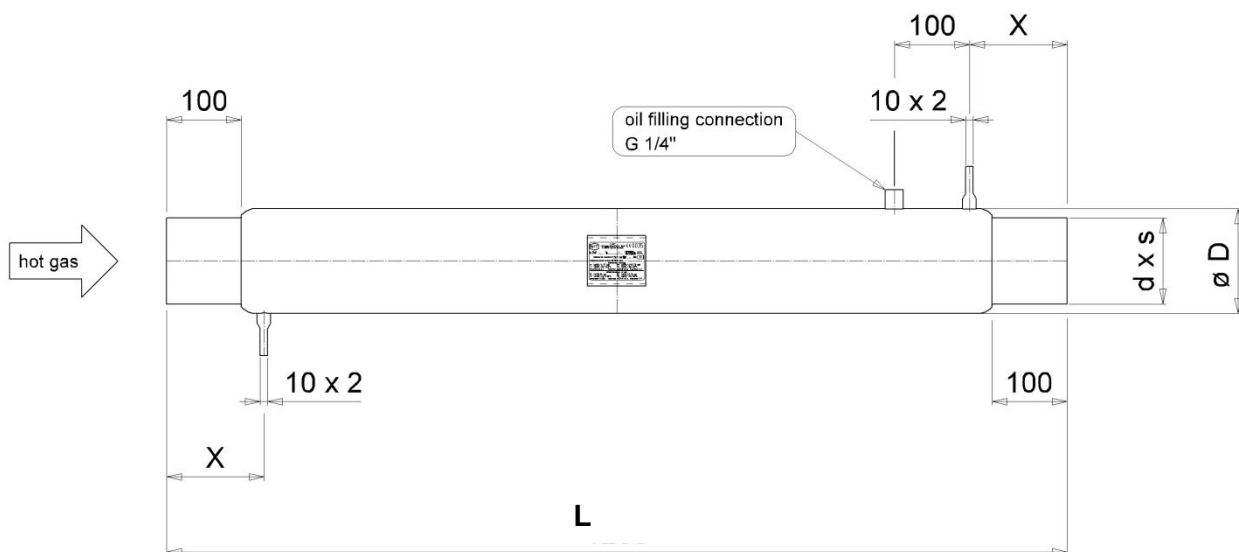
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### 5. TECHN. DATA

#### 5.1 materials

Inner tubes	Seamless steel tubes EN 10216-2, P235GH DIN EN 10216-2
Shell	Seamless steel pipe EN 10216-2, P235GH DIN EN 10216-2
Refrigerant/oil socket	C 22.8
G 1/4" socket	C 22.8
coating	W9.1 + W9.2 (2-K Epoxicoating according to DIN ISO 12944/5 with a total nominal thickness of 160 µm, colour: base coating brown, finish coating light grey RAL 7001)

#### 5.2 Dimensions



Type – 25 bar	[mm]				Content [Liter]		Weight [kg]	
	DN	d x s	Ø D	L	X	tubes (hotgas)		Shell (refrigerant/oil)
DWR 25	33,7 x 3,2	48,3	1200	130		0,71	0,57	8
DWR 32	42,4 x 3,2	60,3	1200	130		1,22	0,92	9
DWR 40	48,3 x 3,2	60,3	1200	130		1,7	0,50	9,5
DWR 50	60,3 x 3,2	76,1	1200	130		2,7	1,03	12
DWR 65	76,1 x 3,2	88,9	1200	130		4,6	0,80	14,5
DWR 80	88,9 x 3,2	114,3	1200	130		6,4	2,80	19
DWR 100	114,3 x 3,6	139,7	1200	130		12,9	3,4	26
DWR 125	139,7 x 4	193,7	1200	195		14,7	10,5	44
DWR 150	168,3 x 4,5	219,1	950	195		24	10,5	48
DWR 200	219,1 x 6,3	355,6	1200	248		40	50	120
<b>Type – 40 bar</b>								
DWR 80	88,9 x 3,2	168,3	1000	195		9,09	4,19	32,1

#### 5.3 Pressure/temperature range

##### Inner tubes (hot gas) 25 bar:

- 1/25 bar at -10/+150°C
- 1/18,75 bar at -10/-60°C

##### Shell (refrigerant/oil mixture)

- 1/17 bar at -10/+150°C
- 1/12,75 bar at -10/-60°C

##### Inner tubes (hot gas) 40 bar:

- 1-/40 bar at -10/+150°C
- 1/30 bar at -10/-60°C

##### Shell (refrigerant/oil mixture)

- 1/40 bar at -10/+150°C
- 1/30 bar at -10/-60°C

### 6. DESCRIPTION OF OPERATION

The flow heat exchanger DWR is normally used in combination with other components of the WITT oil return system WOR. The fluid that is pushed out of the WITT BDP2 that belongs to the WOR system may be pure oil or an oil/refrigerant mixture.

To avoid liquid refrigerant may enter the surge line to the compressor any residue liquid refrigerant that may be left in the oil/refrigerant mixture is evaporated by the flow heat exchanger DWR. (To evaporate 1 Liter ammonia you will need heat of about. 0,25 kWh; for 1 liter R22 only 0,07 kWh ).

For this purpose hot gas from the compressor is used and directed through the inner tubes.

Oil/refrigerant mixture is moved to the bottom 10x2 connection and lead out of the flow heat exchanger shell over the 10 x 2 connection respective the oil filter socket G1/4". On the way through the shell area, the refrigerant is completely evaporated. The best efficiency is achieved with vertical mounting.

### 7. SHIPPING AND STORAGE

All openings (connections, etc.) are covered with yellow protection caps to prevent the intake of moisture or dirt.

Storage shall be dry and protected from any dirt or debris.

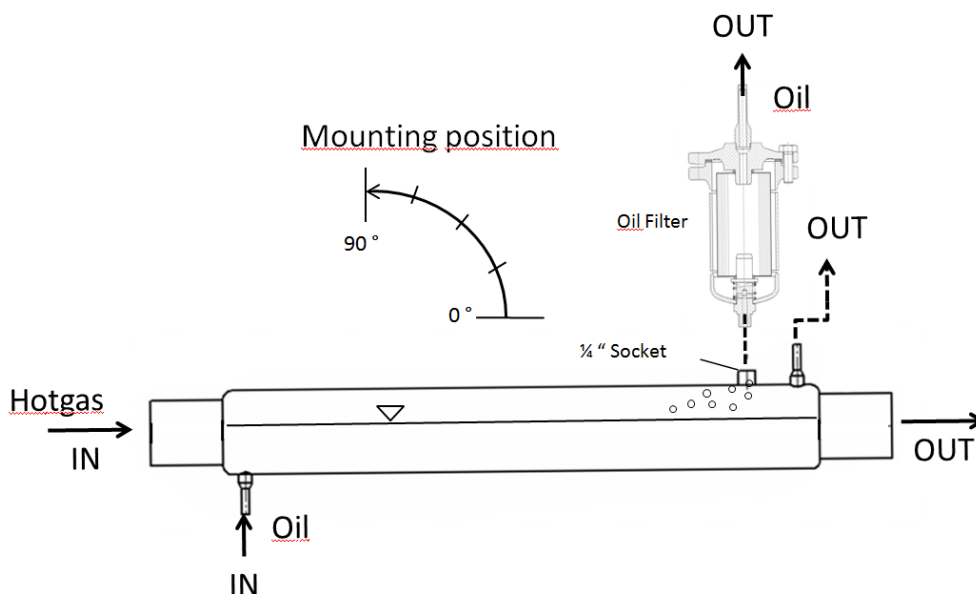
Both 10x2 connections are capped in the delivery condition and you should open them by a saw cut approximately 6 mm off the connection ends immediately prior (and not before) installation.

Make sure no chips or dirt contaminates the DWR.

### 8. INSTALLATION

The DWR is suitable for horizontal, rising or vertical installation into a pressure or liquid line. The hot gas connection is welded on to the inner tube according to drawing Chap. 5.2 in the flow direction.

The G 1/4" socket is intended either as an oil filling connection (prefilling) or to screw-on a WITT oil filter ÖF-G1/4". If a WITT oil filter ÖF-G1/4" is used, the adjacent 10x2 connection remains closed. It is to be noted that the oil filter should always be mounted on top! (Degassing). Both 10x2 connections are used to connect the oil return pipes and are suitable for olive type tube screw fittings, soldering or welding.



Make sure all interconnecting pipework is stress free when installation the DWR. Do not allow vibrations to stress any connections.



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### 9. PRE-COMMISSIONING

Upon installation the entire system has to undertake a thorough visual inspection. All screw and flange connections have to be re-tightened.

The refrigerant plant must be leak and pressure tested and documentation relating to the testing kept in a safe place. Pay particular attention to any welded, soldered or screw connections that have been made on site.

#### Please make sure that

- all piping has been connected according to the drawings
- the required safety devices are installed and tested

### 10. COMMISSIONING

Commissioning and start up of the DWR heat exchanger is not permitted until a safety analysis of the entire refrigeration installation has been carried out.

#### Liquid charge

Since hot gas respective oil/refrigerant is flowing through, the DWR is not charged with oil or refrigerant.

#### Permissible Fluids

WITT DWR are suitable for common evaporating refrigerants respective refrigerant/oil mixtures, e.g. NH<sub>3</sub>, R 404, R134a, R 22, R 507, propane and the matching refrigerant oils.

When using ammonia it is not allowed to use non-ferrous metals.

### 11. OPERATION

The DWR should operate within the limitations mentioned on the nameplate. The design engineer and the operator is responsible to meet the design criteria

### 12. SERVICING AND INSPECTION



A visual inspection of the HDB oil drain vessel shall be carried out at regular intervals according to local regulations and codes of practice.

If a WITT oil filter ÖF is fitted this has to be inspected regularly (once a year) and replaced if necessary.



The DWR has to be visually checked according to EN 378-2. (This includes visual testing with regard to corrosion)

### 13. TROUBLE SHOOTING

Problem	Cause	Corrective action
No flow of refrigerant oil mixture through the DWR	Oil filter blocked	Replace oil filter