

reflex

Thinking solutions.



PRESSURE TANKS PRODUCT BROCHURE 2021

THE COMPANY

Reflex Winkelmann GmbH – part of the Building+Industry division – is a leading provider of high quality cold water, heating and hot-water supply technology. Under its Reflex brand, the company, develops, produces and sells not only expansion vessels, but also innovative components and holistic solutions for potable cold water, pressure maintenance, water make-up, degassing and water treatment, hot water storage tanks, heat exchangers, as well as hydraulic manifolds and storage components. With its headquarters located in Ahlen in the German region of Westphalia, Reflex Winkelmann GmbH has more than 1,500 employees worldwide, giving it an international presence in all major markets.

Committed to a sustainable energy policy and the climate-policy goals agreed by the German

Federal Government, Reflex is already contributing to environmental protection with its energy-efficient and sustainable products. This is built on proven technologies and future-oriented innovations. The Reflex portfolio is completed by maintaining a cooperative partnership and customer focus as well as offering additional services such as an own factory customer service and a comprehensive range of training options.



A POWERFUL BRAND FOR DECADES

CONTENTS

Diaphragm and bladder expansion vessels. For potable applications.

Refix DE

Non-replaceable bladder for DE, according to DIN EN 13831 norm.

All vessel parts in contact with water are corrosion resistant and meets or exceeds EC norms for pressure vessels 2014/108/EC directives.



Refix DC

Non-replaceable diaphragm for DC, according to DIN EN 13831 norm.

All vessel parts in contact with water are corrosion resistant and meets or exceeds EC norms for pressure vessels 2014/108/EC directives.



THE BRAND

Reflex tanks are ideally suited for a wide range of applications including booster systems, bore hole systems, sprinklers, irrigation systems, HVAC, thermal expansion and water hammer arresting.

FEATURES

- Manufactured in Europe
- 304 (DE, HW) AND 316TI (DC) Stainless Steel water connection
- Corrosion resistant for long life
- UV resistant epoxy coating with a minimum thickness of 30 micron in blue RAL5007
- Air valve with sealing cap eliminates leaks
- Internal coating for drinking water applications
- Food grade approved high-grade butyl membranes and bladders WRAS, ACS, AS/NZS4020
- Maximum working temperature 70° C
- Maximum working pressures of 145psi/10bar or 232psi/16bar
- Tank pre-charge 58psi/4bar Nitrogen
- 5 year tank replacement guarantee

BENEFITS

- Constructed for long life
- Extends pump life
- Reduces pump starts and noise
- Protects against water hammer and thermal expansion

Pre-Charge Nitrogen



APPLICATIONS

An energy saving device such as a Reflex Pressure Tank pressure storage cell, stores energy in the form of pressurised water.

The energy is transformed by the pump from electricity to water pressure. With a Reflex Pressure Tank, there is no loss of energy once it has been stored in the device. By installing a Reflex Tank, the pump start events can be cut by 40 – 80%.

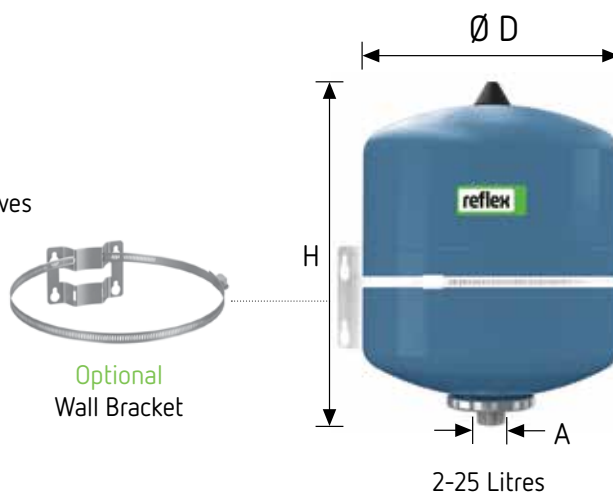
- Saving Power
- Extending Pump Life
- Reducing Noise
- Low initial cost

The Reflex Tank is easy to fit to most pumps and can also be wall mounted. The tank can be installed within minutes and the system can be fitted to any brand or type of pump.

REFIX DE - 10 BAR 70°C

- 2-18 Litres
- Bladder according to DIN EN 13831
- All vessel parts in contact with water are corrosion resistant
- Meets or exceeds EC norms for pressure vessels 2014/108/EC directives
- Durable epoxy coating
- Factory pre-charged
- Vertical

WARRANTY & CERTIFICATIONS



| Part Number | Item Code | Total Volume (L) | Nominal Draw-Off (L) | Weight (Kg) | Ø D (mm) | H (mm) | A (BSP) | Pre-Charge Pressure Bar |
|-------------|-----------|------------------|----------------------|-------------|----------|--------|---------|-------------------------|
| REF-DE2 | 806043* | 2 | 1 | 1.0 | 132 | 260 | ¾ - 1" | 4 |
| REF-DE8 | 806044* | 8 | 3 | 1.7 | 206 | 335 | ¾ - 1" | 4 |
| REF-DE18 | 806045* | 18 | 6 | 2.8 | 280 | 410 | ¾ - 1" | 4 |

Item Codes marked * are WaterMark approved to WMTS-485:2018 Certificate No. 23340

REFIX DE - 16 BAR 70°C

| Part Number | Item Code | Total Volume (L) | Nominal Draw-Off (L) | Weight (Kg) | Ø D (mm) | H (mm) | A (BSP) | Pre-Charge Pressure Bar |
|-------------|-----------|------------------|----------------------|-------------|----------|--------|---------|-------------------------|
| REF-DE8-16 | 806046 | 8 | 3 | 2.8 | 206 | 335 | ¾ - 1" | 4 |
| REF-DE25-16 | 806048 | 25 | 9 | 5.8 | 280 | 520 | ¾ - 1" | 4 |
| REF-DE80-16 | 806049 | 80 | 29 | 18.0 | 480 | 745 | ¾ - 1" | 4 |

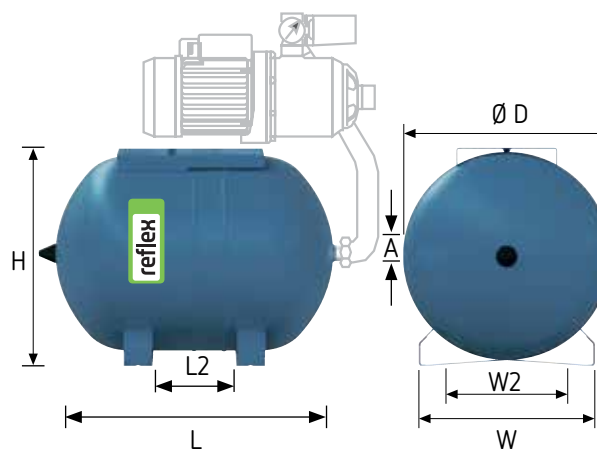
Factory pre-charge 4 bar nitrogen. ¾" - 1" Outlet. Bladder According to DIN EN 13831.
All metal parts in contact with water are corrosion resistant. Durable Epoxy coating.
Meets or exceeds EC norms for Pressure Vessels 2014 / 108 / EC directives.



REFIX HW

- 25-80 Litres
- Diaphragm according to DI EN 13831 norm part 3
- All vessel parts are corrosion resistant
- Meets or exceeds EC norms for pressure vessels 2014/108/EC directives
- Durable epoxy coating
- Factory pre-charged nitrogen
- Horizontal

WARRANTY & CERTIFICATIONS



| Model 10 bar / 70°C | Item Code | Total Volume litres | Nominal Draw-Off litres | Weight kg | Ø D mm | H mm | L mm | L2 mm | W2 mm | W mm | A | Pre-charge Pressure Bar |
|---------------------|-----------|---------------------|-------------------------|-----------|--------|-------|------|-------|-------|------|----|-------------------------|
| REF-HW25 | 806058* | 25 | 9 | 5.3 | 280 | 293.4 | 520 | 228 | 214 | 270 | 1" | 2 |
| REF-HW60 | 806059* | 60 | 18 | 15.0 | 409 | 433 | 503 | 175 | 285 | 350 | 1" | 2 |
| REF-HW80 | 806060* | 80 | 29 | 17.0 | 480 | 495 | 595 | 230 | 285 | 355 | 1" | 2 |

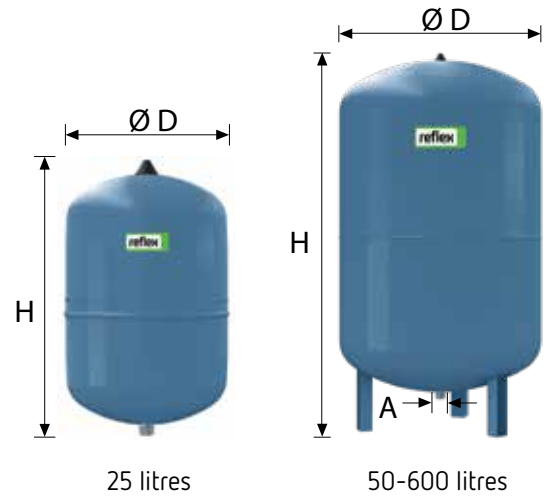
Factory pre-charge 2 bar nitrogen. 1" Outlet.

Item Codes marked * are WaterMark approved to WMTS-485:2018 Certificate No. 23340

REFIX DC - 10 BAR / 70°C

- 25-600 Litres
- Diaphragm, according to DIN EN 13831 norm part 3
- All vessel parts in contact with water are corrosion resistant
- Meets or exceeds EC norms for pressure vessels 2014/108/EC directives
- Durable epoxy coating
- Factory pre-charged nitrogen
- Vertical / Free-Standing

WARRANTY & CERTIFICATIONS



| Part Number | Item Code | Total Volume (L) | Nominal Draw-Off (L) | Weight (Kg) | Ø D (mm) | H (mm) | A (BSP) | Pre-Charge Pressure Bar |
|-------------|-----------|------------------|----------------------|-------------|----------|--------|---------|-------------------------|
| REF-DC25 | 806050* | 25 | 9 | 4.7 | 280 | 520 | 1" | 4 |
| REF-DC50 | 806051* | 50 | 18 | 12.5 | 409 | 588 | 1" | 4 |
| REF-DC80 | 806052* | 80 | 29 | 17.0 | 480 | 680 | 1" | 4 |
| REF-DC100 | 806053* | 100 | 36 | 20.5 | 480 | 785 | 1" | 4 |
| REF-DC140 | 806054* | 140 | 50 | 29.0 | 480 | 997 | 1" | 4 |
| REF-DC200 | 806055* | 200 | 72 | 40.0 | 634 | 883 | 1" | 4 |
| REF-DC300 | 806056* | 300 | 108 | 52.0 | 634 | 1184 | 1" | 4 |
| REF-DC400 | 806057* | 400 | 144 | 78.0 | 740 | 1173 | 1" | 4 |
| REF-DC500 | 807780^ | 500 | 320 | 80.0 | 740 | 1392 | 1" | 4 |
| REF-DC600 | 807781^ | 600 | 384 | 103.0 | 740 | 1629 | 1" | 4 |

Item Codes marked * are WaterMark approved to WMTS-485:2018 Certificate No. 23340

Item Codes marked ^ are stocked in New Zealand only



ACCESSORIES

Wall Bracket
Optional



Digital pressure gauge

- + Supply pressure test device to approx. 9 bar



Reflex Lockshield Valve

- + Lockshield valve for maintenance and detachment of expansion vessels
- + With drainage
- + According to DIN EN 12828
- + PN 10 / 120°C



MFC Kit



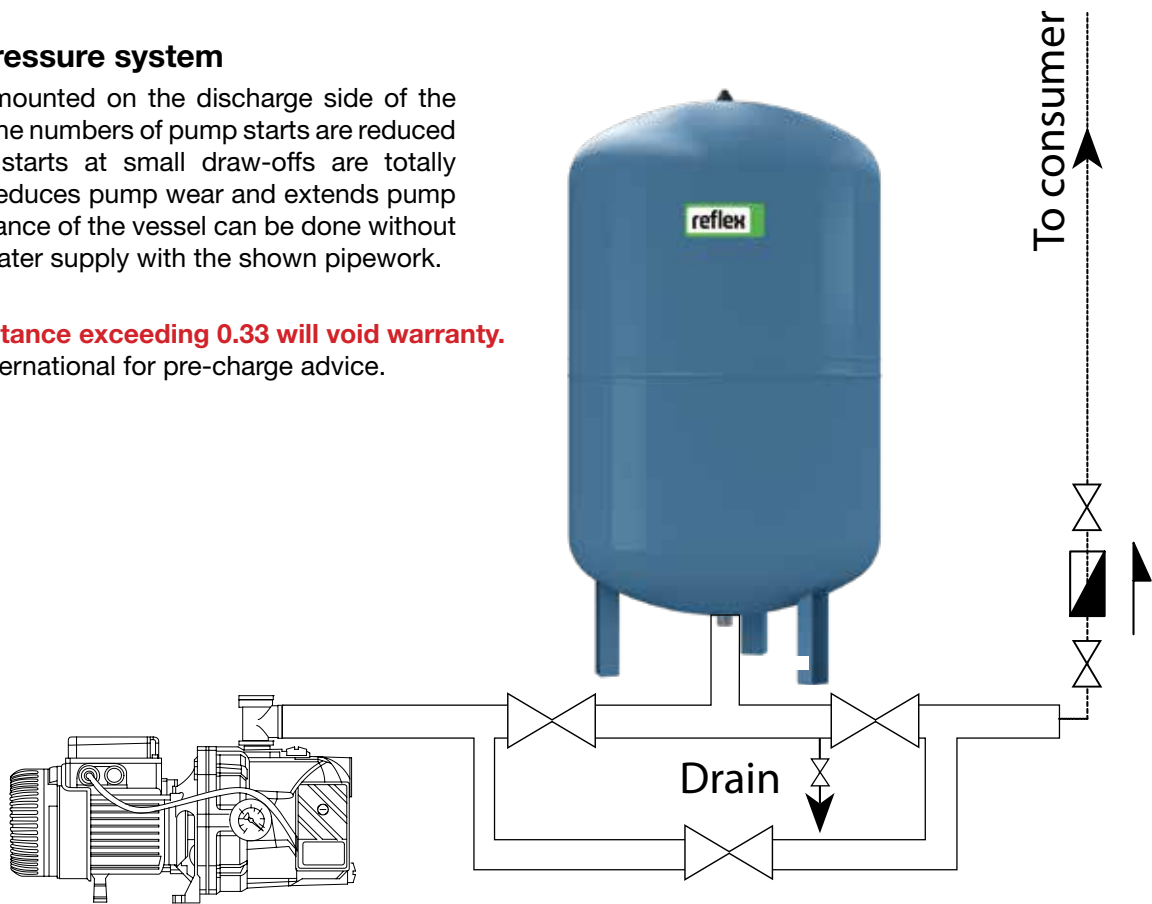
| Model | Item Code | Description |
|------------------|-----------|-------------------------|
| REF-WALLBRACKET | 806107 | Wall Bracket |
| REF-LOCKSHEILD1 | 806108 | Lockshield Valve 1" |
| REF-PG | 806109 | Digital Pressure Gauge |
| REF-1000MFCKIT* | 702977 | 1" F x 1" M x 1000mm |
| REF-1000MFECKIT* | 702978 | 1" 90°F x 1" M x 1000mm |

*Includes nuts, bolts, washers, thread tape and instruction sheet for mounting pumps onto horizontal pressure tanks. Some dealer supplied fittings may be required for some pressure systems. Maximum working pressure 2070kPa, rigid pipework is recommended.

Vessel on a pressure system

With the vessel mounted on the discharge side of the booster system, the numbers of pump starts are reduced and also pump starts at small draw-offs are totally eliminated. This reduces pump wear and extends pump life time. Maintenance of the vessel can be done without shutting off the water supply with the shown pipework.

Maximum acceptance exceeding 0.33 will void warranty.
Contact White International for pre-charge advice.



Configuration: Reflex on discharge side of pressure system pump.

• To restrict the switch frequency of pressure-controlled systems

| | | |
|---|--------|-----------|
| Cut-in pressure | Pin | =.....bar |
| Cut-out pressure | Pout | =.....bar |
| Delivery rate* | VmaxP | =.....l/h |
| *Flow at pressure switch cut out pressure | | |
| Switch frequency | s | =.....1/h |
| Number of pumps n | =..... | |

| | | | | |
|----------------------|-----|-------|-------|-------|
| s - switch frequency | 1/h | 20 | 15 | 10 |
| Pump output | kW | ≤ 4.0 | ≤ 7.5 | ≤ 7.5 |

$$\text{Nominal volume } V_n = 0,33 \times V_{\text{maxP}} \frac{(P_{\text{out}} + 1)}{(P_{\text{out}} - P_{\text{in}}) \times s \times n}$$

Example:
1 x DAB-251MP

| | | |
|------------------|--------|--|
| Cut-out pressure | 538kPa | 5.4bar |
| Cut-in pressure | 317kPa | 3.2bar |
| Delivery rate* | 1.85kW | Flow at cut out pressure 32 l/m or 1920 l/hr |

$$= 133 \times 1920 \times \frac{(5.4 + 1)}{(5.4 - 3.2) \times 20 \times 1}$$

$$= 633.6 \times \frac{6.4}{44}$$

$$= 92.16 \text{ litres}$$

Select REF - 100V

Pre-charge instructions

1. Pressure switch controlled pumps with differential pressure set at 140 kPa (20 psi), pre-charge the tank to 20 kPa (3 psi) below the cut in pressure.
2. For pumps controlled by pressure switches with higher differential pressures, electronic controls or variable speed controls, pre-charge the tank to 65% of the maximum system pressure.
3. Pressure tanks installed on mains pressure, pre-charge should be set at the mains pressure.
4. For hot water expansion, pre-charge should be set at the mains pressure.



Reflex Factory

Pressure Tank Pre-Charge

A pressure tank should be sized to reduce the number of pump starts.

For pumps with a motor of less than 4kW, pump starts should be less than 20x per hour.

For 4kW to 7.5kW, pump starts should be less than 15x per hour.

Over 7kW motor size, limit pump starts to less than 10x per hour

A pressure tank must never accept more than 1/3 of its total volume in water

Tank precharge should be 2/3 (66.6%) of full system pressure

When there is ≤ 1.4 Bar (20psi) between the pump start and pump stop pressure.

Precharge can be set 0.2 Bar (3 PSI) below the cut-in (start) pressure.

Pressure Controllers and Variable Speed Drives.

Set the precharge to 2/3 (66.6%) of full system pressure.

To control water hammer, allow for thermal expansion or to otherwise.

Damp pressure fluctuations, set precharge equal to full system pressure (100%)

| BAR | | CUT IN PRESSURE | | | | | | | | | | | | | | | |
|------------------|-----|-----------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | | 1.5 | 2.0 | 2.5 | 3.0 | 3.5 | 4.0 | 4.5 | 5.0 | 5.5 | 6.0 | 6.5 | 7.0 | 8.0 | 9.0 | 10.0 | |
| CUT OUT PRESSURE | 2.5 | 1.30 | 1.80 | | | | | | | | | | | | | | |
| | 3.0 | 1.66 | 1.80 | 2.30 | | | | | | | | | | | | | |
| | 3.5 | 2.00 | 1.80 | 2.30 | 2.80 | | | | | | | | | | | | |
| | 4.0 | 2.33 | 2.33 | 2.33 | 2.80 | 3.30 | | | | | | | | | | | |
| | 4.5 | 2.66 | 2.66 | 2.66 | 2.80 | 3.30 | 3.80 | | | | | | | | | | |
| | 5.0 | 3.00 | 3.00 | 3.00 | 2.80 | 3.30 | 3.80 | 4.30 | | | | | | | | | |
| | 5.5 | 3.33 | 3.33 | 3.33 | 3.33 | 3.30 | 3.80 | 4.30 | 4.80 | | | | | | | | |
| | 6.0 | | | 3.66 | 3.66 | 3.66 | 3.80 | 4.30 | 4.80 | 5.30 | | | | | | | |
| | 6.5 | | | 4.00 | 4.00 | 4.00 | 4.00 | 4.30 | 4.80 | 5.30 | 5.80 | | | | | | |
| | 7.0 | | | 4.33 | 4.33 | 4.33 | 4.33 | 4.33 | 4.80 | 5.30 | 5.80 | 6.30 | | | | | |
| | 8.0 | | | 4.99 | 4.99 | 4.99 | 4.99 | 4.99 | 4.99 | 5.30 | 5.80 | 6.30 | 6.80 | | | | |
| | 9.0 | | | | | 5.66 | 5.66 | 5.66 | 5.66 | 5.66 | 5.80 | 6.30 | 6.80 | 7.80 | | | |
| 10.0 | | | | | 6.33 | 6.33 | 6.33 | 6.33 | 6.33 | 5.80 | 6.30 | 6.80 | 7.80 | 8.80 | | | |
| 11.0 | | | | | | 6.99 | 6.99 | 6.99 | 6.99 | 6.99 | 6.99 | 6.99 | 6.99 | 7.80 | 8.80 | 9.80 | |
| 12.0 | | | | | | | 7.66 | 7.66 | 7.66 | 7.66 | 7.66 | 7.66 | 7.66 | 7.66 | 7.80 | 8.80 | 9.80 |

Blue cells - precharge is 66.6% of cut out pressure.
 In this situation the tank precharge pressure is greater than the cut in pressure.
 Ideally, pump cut in or cut should be altered to co-incide with that of a green cell

| PSI | | CUT IN PRESSURE | | | | | | | | | | | | | | |
|------------------|-------|-----------------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | 20.0 | 30.0 | 40.0 | 50.0 | 60.0 | 70.0 | 80.0 | 90.0 | 100.0 | 110.0 | 120.0 | 130.0 | 140.0 | 150.0 | 160.0 |
| CUT OUT PRESSURE | 35.0 | 18.4 | 28.0 | | | | | | | | | | | | | |
| | 40.0 | 21.7 | 28.0 | | | | | | | | | | | | | |
| | 45.0 | 25.1 | 28.0 | 38.0 | | | | | | | | | | | | |
| | 50.0 | 28.4 | 28.4 | 38.0 | | | | | | | | | | | | |
| | 60.0 | 35.1 | 35.1 | 38.0 | 48.0 | | | | | | | | | | | |
| | 70.0 | 41.7 | 41.7 | 41.7 | 48.0 | 58.0 | | | | | | | | | | |
| | 80.0 | 48.4 | 48.4 | 48.4 | 48.4 | 58.0 | 68.0 | | | | | | | | | |
| | 90.0 | | | 55.0 | 55.0 | 58.0 | 68.0 | 78.0 | | | | | | | | |
| | 100.0 | | | 61.7 | 61.7 | 61.7 | 68.0 | 78.0 | 88.0 | | | | | | | |
| | 110.0 | | | 68.4 | 68.4 | 68.4 | 68.4 | 78.0 | 88.0 | 98.0 | | | | | | |
| | 120.0 | | | 75.0 | 75.0 | 75.0 | 75.0 | 78.0 | 88.0 | 98.0 | 108.0 | | | | | |
| | 130.0 | | | | | 81.7 | 81.7 | 81.7 | 88.0 | 98.0 | 109.8 | 119.8 | | | | |
| | 140.0 | | | | | 88.3 | 88.3 | 88.3 | 88.3 | 98.0 | 108.0 | 118.0 | 128.0 | | | |
| | 150.0 | | | | | | 95.0 | 95.0 | 95.0 | 95.0 | 95.0 | 108.0 | 118.0 | 128.0 | 138.0 | |
| 160.0 | | | | | | 101.7 | 101.7 | 101.7 | 101.7 | 108.0 | 118.0 | 128.0 | 138.0 | 148.0 | | |
| 170.0 | | | | | | 108.3 | 108.3 | 108.3 | 108.3 | 108.3 | 118.0 | 128.0 | 138.0 | 148.0 | 158.0 | |

Blue cells - precharge is 66.6% of cut out pressure.
 In this situation the tank precharge pressure is greater than the cut in pressure
 Ideally, pump cut in or cut should be altered to co-incide with that of a green cell

Drawdown Factors Greater Than 0.333 Will Void Warranty

Disclaimer: Every effort has been made to publish the correct details in this brochure. No responsibility will be taken for errors, omissions or changes in product specifications.

Available from your local Reflex distributor:

REFLEXBROCHURE_JULY_2021

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