

QVF® PHARMA REACTOR SERIES

Reaction units are of considerable importance to the chemical and pharmaceutical industry in production and development. Particularly where small volumes are concerned batchwise reaction and distillation is an economic process.

- ☞ - 16 to 63 litre compact version
- ☞ - new vessel design
- ☞ - according GMP needs

Pharmaceutical applications resulted in demands for the design of the QVF® PHARMA REACTOR. The development goals were maximum purity and optimised heat and mass transfer combined with suitability for GMP use.

To suit the availability of space in the majority of laboratories the QVF® PHARMA REACTOR is designed for reaction vessel capacities from 16 to 63 litres in a compact layout with reduced headroom requirements.

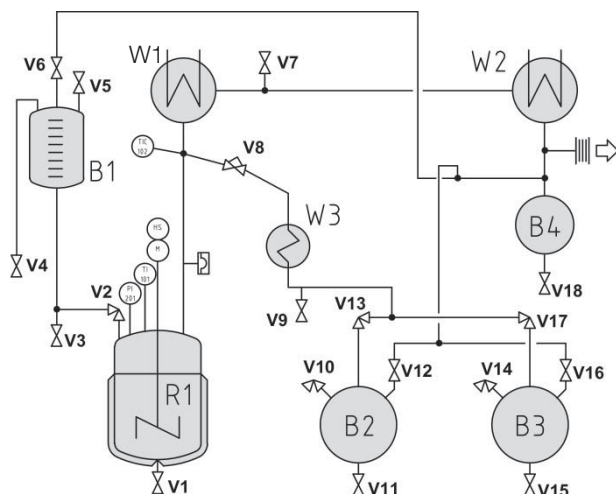


Fig. 1: PHARMA REACTOR 16 - 63 l

P138e.2

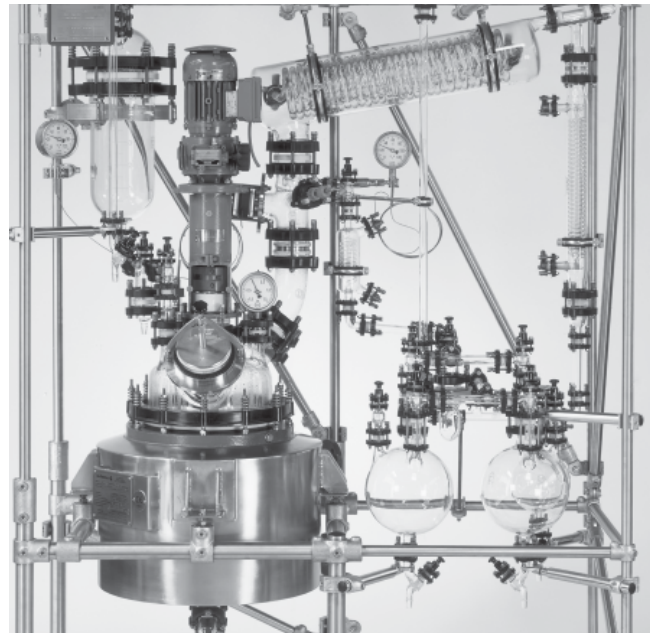


Fig. 2: PHARMA REACTOR 16 l

vessel	heating area m ²	W1 m ²	W2 m ²	B1 l	B2/B3 l
16	0,25	1,0	0,2	5	5
25	0,37	1,0	0,2	10	10
40	0,53	2x0,7	0,3	20	20
63	0,75	2x1,0	0,3	20	20

Tab. 1: Technical data - PHARMA REACTOR

FUNCTION

The QVF® PHARMA REACTOR is specially designed for the two process stages of reaction and distillation. The reaction stage operates under total reflux, whereupon the solvent can be distilled off as effectively as possible in the concentration phase. Both stages can be carried out under either positive pressure (0.6 bar) or vacuum. The materials of construction used are borosilicate glass 3.3, glass-lined steel and PTFE.

DISTILLATION OVERHEAD ASSEMBLY

The distillation overhead assembly comprises components from QVF®'s high quality World Product Range which is approved as meeting the Pressure Equipment Directive and the equipment safety regulations and which carries the CE mark. With its safety flat buttress end it provides not only a GMP-compliant coupling but also a wide variety of well thought-out individual solutions.

To ensure that the equipment drains completely the horizontal piping carrying the product is largely installed at an angle of 5°. The inclined condenser has a rinsing neck and the receiver vessel can be emptied and rinsed out during the process by means of valve V3.

The integral sampling valve V9 is used to take samples from the current distillate flow, even when operating under vacuum. In the basic version of the PHARMA REACTOR the instrumentation is restricted to basic functions. In addition to the temperature of the vessel content and the distillate, the pressure is indicated by a tantalum membrane manometer. A bursting disk provides protection against excess pressure. The rotation speed of the enamelled impeller stirrer can be adjusted by means of the handwheel on the drive.

All the valves are located close to the vessel involved, thus enabling direct and correct operation. Valve V8 controls the adjustment of the integral reflux separator.

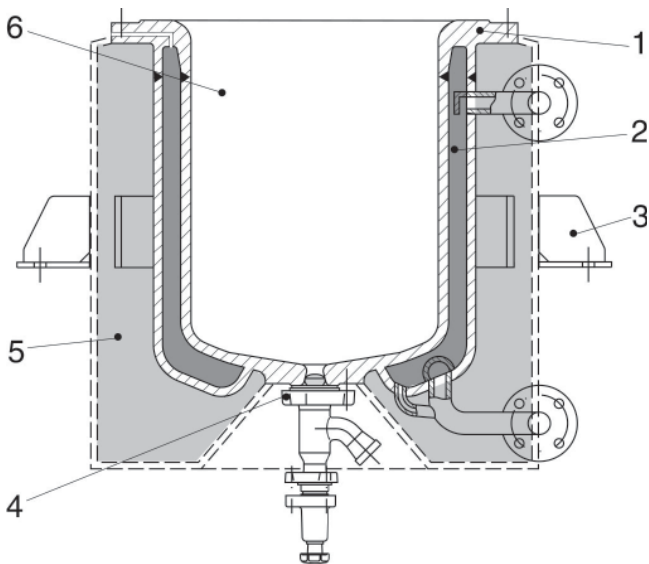


Fig. 3: Special reaction vessel developed by DDPS

REACTION VESSEL

The enamelled reaction vessel developed by DDPS for the PHARMA REACTOR has the following special features:

- Block flange for connection to the glass cover (1)
- Heating jacket up to the flange (2)
- Support brackets without thermal bridge (3)
- Block flange with minimal dead space bottom outlet valve (4)
- Polished insulating jacket with foam glass, stainless steel, tightly welded (5)
- White enamel to improve visual control (6)

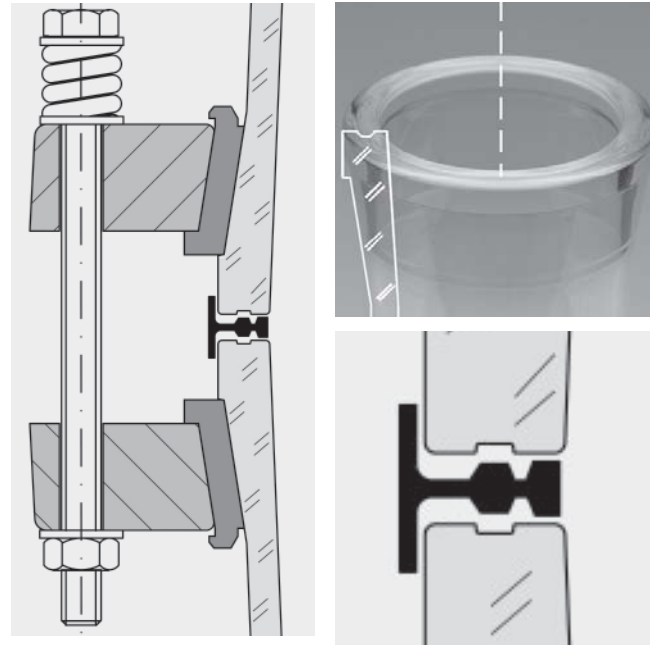


Fig. 4: Safety flat buttress end with GMP gasket

SAFETY FLAT BUTTRESS END WITH GMP GASKET

In addition to the basic benefits of the flat glass buttress end the "safety flat buttress end" (SPF) developed by QVF® has two special features which make it the obvious choice for GMP-compliant plant. All nominal bores up to DIN 300 have fire-polished sealing faces and a groove. The groove stabilises and ensures positive location of the PTFE gasket seated on the extremely smooth sealing face. Together with the special GMP gasket, which, via centring in the groove and on the outer edge, effects a seal on the inside diameter of the flange, the safety flat buttress end provides a coupling with minimal dead space in pipelines laid out at an angle of at least 5°.

MODULAR CONSTRUCTION

Because of its modular construction the basic version of the PHARMA REACTOR can be expanded to handle various special functions. The following options are, therefore, available:

- Hydraulic lifting device for the reaction vessel
- Phase separator
- Electronic speed indicator
- High pressure version
- Coated glass components
- Weighting cells for reactor, feed and distillate vessel
- Double-acting mechanical seal
- Anchor, turbine and propeller type stirrers
- Process control engineering