

MK 45 with flanges

## Steam Trap

### MK 45-1, MK 45-2, MK 45A-1, MK 45A-2 PN 40 / Class 300 DN 15, 20, 25 (½", ¾", 1")

#### Description

Thermostatic steam trap with corrosion-resistant thermostatic capsule. With Y-type strainer and integrated water hammer protection. Do not expose the control membrane capsule to superheat conditions above 5°C.

Steam traps with standard capsule "N" discharge condensate with approx. 10 K below boiling temperature, traps with capsule "U" with an undercooling of approx. 30 K and traps with capsule "H" with approx. 5 K undercooling.

#### MK 45-1, MK 45A-1 with tandem seat (double sealing)

Particularly for low condensate flowrates. Optionally with standard capsule 5N1 or special capsule 5U1 or 5H1.

#### MK 45-2, MK 45A-2 with single seat

For larger condensate flowrates. Optionally with standard capsule 5N2 or special capsule 5U2 or 5H2.

#### Pressure /Temperature Ratings

MK 45, flanged PN 40, EN 1092-1									
Pressure <sup>1)</sup> p	[barg]	40.0	37.1	33.3	30.4	27.6	25.7	23.8	17.1
Temperature <sup>1)</sup> T	[°C]	-10/20	100	200	250	300	350	400	420
Max. admissible differential pressure ΔPMX	[bar] / [psig]	32 / 465							
Admissible service temperature	Saturated steam temperature								
Pressure <sup>1)</sup> p	[psig]	580	537.95	483	441	400	373	345	190
Temperature <sup>1)</sup> T	[°F]	14/68	212	392	482	572	662	752	842

<sup>1)</sup> Resistance limits for body/cover to EN 1092-1

MK 45, flanged Class 150, ASME B16.5									
Pressure <sup>1)</sup> p	[barg]	19.6	17.7	13.8	12.1	10.2	8.4	6.5	5.5
Temperature <sup>1)</sup> T	[°C]	-29/38	100	200	250	300	350	400	425
Max. admissible differential pressure ΔPMX	[bar] / [psig]	19.6 / 284							
Admissible service temperature	Saturated steam temperature								
Pressure <sup>1)</sup> p	[psig]	284	256.65	200	175	148	122	94	80
Temperature <sup>1)</sup> T	[°F]	-20/100	212	392	482	572	662	752	797

<sup>1)</sup> Resistance limits for body/cover to ASME B 16.5

MK 45, flanged Class 300, ASME B16.5, butt-weld ends EN 12627 socket-weld ends EN 12760, socket-weld ends Class 3000, ASME B16.11 screwed sockets BSP, ISO 228-1, screwed sockets NPT, ASME B16.11									
Pressure <sup>1)</sup> p	[barg]	51.1	46.6	43.8	41.9	39.8	37.6	34.7	28.8
Temperature <sup>1)</sup> T	[°C]	-10/38	100	200	250	300	350	400	425
Max. admissible differential pressure ΔPMX	[bar] / [psig]	32 / 465							
Admissible service temperature	Saturated steam temperature								
Pressure <sup>1)</sup> p	[psig]	741	675.7	635	608	577	545	503	418
Temperature <sup>1)</sup> T	[°F]	-20/100	212	392	482	572	662	752	797

<sup>1)</sup> Resistance limits for body/cover to ASME B 16.5

MK 45A, flanged PN 40, EN 1092-1									
Pressure <sup>1)</sup> p	[barg]	40	37.2	31.8	29.9	27.6	26.4	25.7	–
Temperature <sup>1)</sup> T	[°C]	-10/20	100	200	250	300	350	400	–
Max. admissible differential pressure ΔPMX	[bar] / [psig]	32 / 465							
Admissible service temperature	Saturated steam temperature								
Pressure <sup>1)</sup> p	[psig]	580	539.4	461	434	400	383	373	–
Temperature <sup>1)</sup> T	[°F]	14/68	212	392	482	572	662	752	–

<sup>1)</sup> Resistance limits for body/cover to EN 1092-1

If the operating temperatures exceed 300°C intercrystalline corrosion may occur. Do not subject the equipment to operating temperatures higher than 300°C unless intercrystalline corrosion can be ruled out.

MK 45A, flanged Class 150, ASME B16.5									
Pressure <sup>1)</sup> p	[barg]	15.9	13.3	11.2	10.5	10	8.4	6.5	–
Temperature <sup>1)</sup> T	[°C]	-29/38	100	200	250	300	350	400	–
Max. admissible differential pressure ΔPMX	[bar] / [psig]	15.9 / 284							
Admissible service temperature	Saturated steam temperature								
Pressure <sup>1)</sup> p	[psig]	231	200.1	162	152	145	122	94	–
Temperature <sup>1)</sup> T	[°F]	-20/100	212	392	482	572	662	752	–

<sup>1)</sup> Resistance limits for body/cover to ASME B 16.5

If the operating temperatures exceed 300°C intercrystalline corrosion may occur. Do not subject the equipment to operating temperatures higher than 300°C unless intercrystalline corrosion can be ruled out.

MK 45A, flanged Class 300, ASME B16.5, butt-weld ends EN 12627 socket-weld ends EN 12760, socket-weld ends Class 3000, ASME B16.11 screwed sockets BSP, ISO 228-1, screwed sockets NPT, ASME B16.11									
Pressure <sup>1)</sup> p	[barg]	41.4	34.8	29.2	27.5	26.1	25.1	24.3	–
Temperature <sup>1)</sup> T	[°C]	-10/38	100	200	250	300	350	400	–
Max. admissible differential pressure ΔPMX	[bar] / [psig]	32 / 465							
Admissible service temperature	Saturated steam temperature								
Pressure <sup>1)</sup> p	[psig]	600	504.6	423	399	378	364	352	–
Temperature <sup>1)</sup> T	[°F]	-20/100	212	392	482	572	662	752	–

<sup>1)</sup> Resistance limits for body/cover to ASME B 16.5

If the operating temperatures exceed 300°C intercrystalline corrosion may occur. Do not subject the equipment to operating temperatures higher than 300°C unless intercrystalline corrosion can be ruled out.

#### End Connections

- Flange EN 1092-1 B1 PN 40
- Flange ASME B 16.5 Class 150 RF, 300 RF
- Screwed sockets G: ISO 228-1
- Screwed sockets NPT: ASME B 16.11
- Socket-weld ends DIN EN 12760
- Socket-weld ends ASME B 16.11 Class 3000
- Butt-weld ends via transition pieces to EN 12627 welded joint geometry ISO 9692-1 code number 1.3 (30° chamfer)
- Butt-weld ends via transition pieces ASME B 16.25 ASME B 36.10

#### Fluids

The equipment is designed for the following fluids (in accordance with the EU Pressure Equipment Directive or Pressure Equipment (Safety) Regulations in the UK):

- Fluids of group 2

Due consideration must be given to chemical and corrosive influences.

#### Application in potentially explosive areas

The equipment does not have its own potential source of ignition (as per ATEX Directive). Please pay attention to the following information:

Make sure that the fluid does not generate excessively high surface temperatures during operation.

The equipment itself does not generate additional surface temperatures.

When installed, static electricity may arise between the equipment and the connected system. When used in potentially explosive atmospheres, the plant manufacturer or plant operator is responsible for discharging or preventing possible static charge.

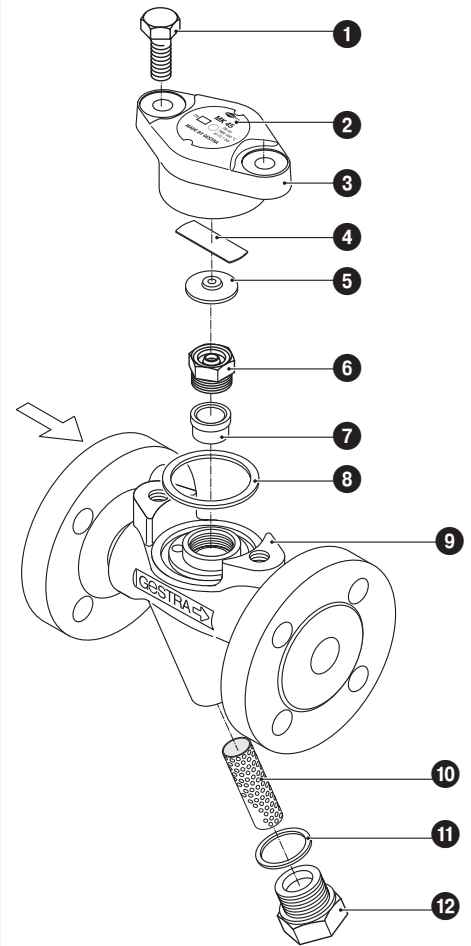
If it is possible for medium to escape, e.g. through actuating mechanisms or leaks in threaded joints, the plant manufacturer or plant operator must take this into consideration when dividing the area into zones.

## Materials of construction

Type	MK 45	
Designation	EN	ASME
Body and cover	1.0460	SA 105
Hexagon-head cap screws	1.7225	A 193 B7
Gasket	Graphite/CrNi	
Membrane regulator capsule	Hastelloy®	
Other internals	High grade steels	

Type	MK 45A	
Designation	EN	ASME
Body and cover	1.4404	SA 182 F316L
Hexagon-head cap screws	A2-70	A 193 B8
Gasket	Graphite/CrNi	
Membrane regulator capsule	Hastelloy®	
Other internals	High grade steels	

## Component Parts MK 45, MK 45A

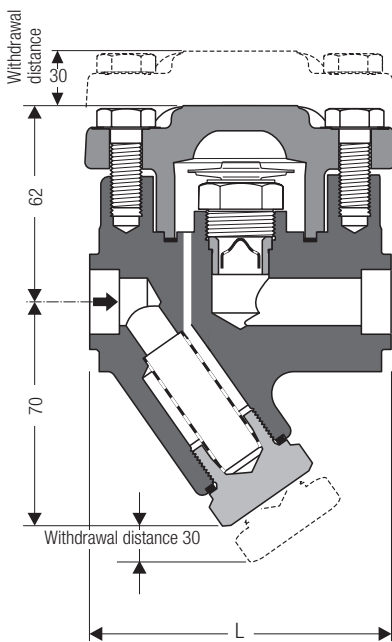
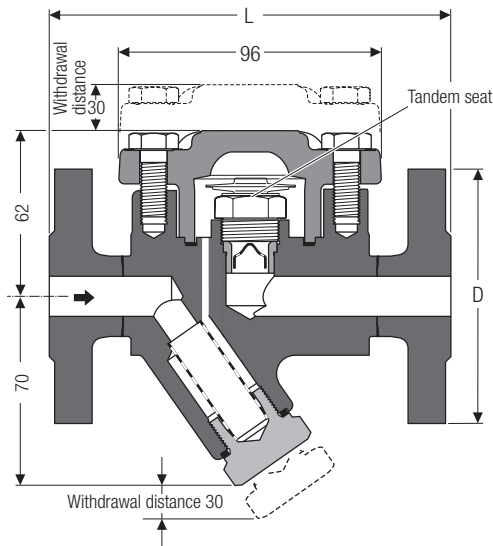


### Key

- ① Hexagon-head screw M 10 x 25
- ② Name plate
- ③ Cover
- ④ Spring
- ⑤ Regulating membrane (capsule)
- ⑥ Nozzle insert with non-return cone
- ⑦ Bushing (interference fitted, no spare part)
- ⑧ Gasket 40 x 48 x 2
- ⑨ Body
- ⑩ Strainer
- ⑪ Gasket A 24 x 29
- ⑫ Sealing plug

Spare parts list see page 3

## Dimensions



## Weights and dimensions for traps with flanged ends

Type	Flanged to	EN 1092-1 PN 40			ASME B 16.5 Class 150			ASME B 16.5 Class 300		
		15	20	25	15	20	25	15	20	25
MK 45, MK 45A	DN	1/2"	3/4"	1"	1/2"	3/4"	1"	1/2"	3/4"	1"
	D [mm]	95	105	115	88.9	98.4	107.9	95.2	117.5	123.8
	L [mm]	150	150	160	150	150	160	150	150	160
	[kg]	3.7	4.3	4.8	3.7	4.3	4.8	3.7	4.3	4.8

## Weights and dimensions for traps with butt-weld ends

Type	Butt-weld ends to	EN 12627 Edge form to ISO 9692, code number 1.3			ASME B 16.25 ASME B 36.10		
		15	20	25	15	20	25
MK 45, MK 45A	DN	1/2"	3/4"	1"	1/2"	3/4"	1"
	for pipe	21.3 x 2.0	26.9 x 2.3	33.7 x 2.6	21.3 x 2.8	26.7 x 2.9	33.4 x 3.4
	L [mm]	200	200	200	200	200	200
	[kg]	2.5	2.5	2.5	2.5	2.5	2.5

Butt-weld ends for other pipe sizes available on request.

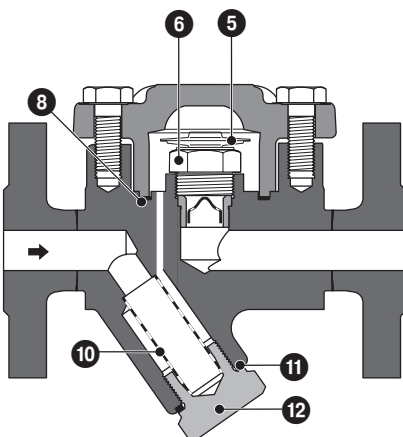
## Weights and dimensions for traps with socket-weld ends

Type	Socket-weld ends to	DIN EN 12760, ASME B 16.11 Class 3000		
		15	20	25
MK 45, MK 45A	DN	1/2"	3/4"	1"
	L [mm]	95	95	95
	[kg]	2.2	2.1	2.0

## Weights and dimensions for traps with screwed sockets

Type	Screwed sockets to	G: ISO 228-1, NPT: ASME B 16.11		
		15	20	25
MK 45, MK 45A	DN	1/2"	3/4"	1"
	L [mm]	95	95	95
	[kg]	2.2	2.1	2.0

## Spare Parts



Item	Designation	Stock code #	
		MK 45-1	MK 45-2
5 6 8	Membrane regulator, complete, 5N1	375 109	
	Membrane regulator, complete, 5U1	375 111	
	Membrane regulator, complete, 5H1	378 521	
5 6 8	Membrane regulator, complete, 5N2		375 110
	Membrane regulator, complete, 5U2		375 112
	Membrane regulator, complete, 5H2		377 589
10 11	Strainer set, cpl.	375 113	375 113
		375 382	375 382
5	Thermostatic capsule <sup>1)</sup> 5N1	376165	
	Thermostatic capsule <sup>1)</sup> 5U1	376166	
	Thermostatic capsule <sup>1)</sup> 5H1	376 173	
5	Thermostatic capsule <sup>1)</sup> 5N2		376167
	Thermostatic capsule <sup>1)</sup> 5U2		376168
	Thermostatic capsule <sup>1)</sup> 5H2		376 174
8	Gasket <sup>2)</sup> 40° x 48 x 2, graphite	375 159	375 159
11	Gasket <sup>2)</sup> 24 x 29, stainless steel	375 162	375 162

<sup>1)</sup> Packaged 10 per box. For smaller quantities please contact your local dealer.

<sup>2)</sup> Packaged 50 per box. For smaller quantities please contact your local dealer.

## Steam Trap

**MK 45-1, MK 45-2,  
MK 45A-1, MK 45A-2  
PN 40 / Class 300  
DN 15, 20, 25 (1/2", 3/4", 1")**

### Capacity Charts

The charts show the maximum capacities for hot and cold condensate.

#### Curve 1

Indicates the max. capacity of hot condensate that steam traps with 5N... capsule can discharge with approx. 10 K below boiling temperature and traps with 5U... capsule can discharge with approx. 30 K below boiling temperature..

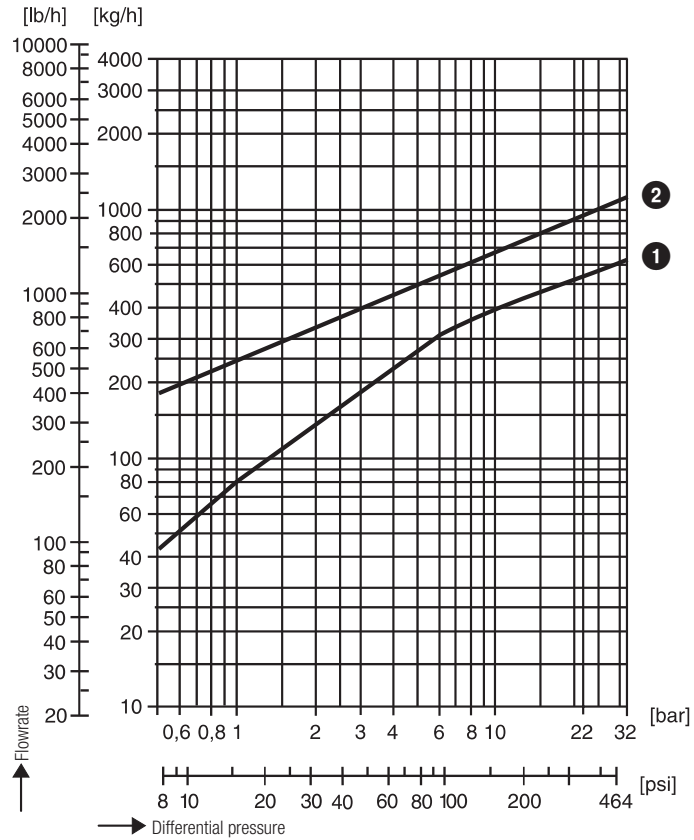
#### Curve 2

Discharge capacity for cold condensate at 20°C.

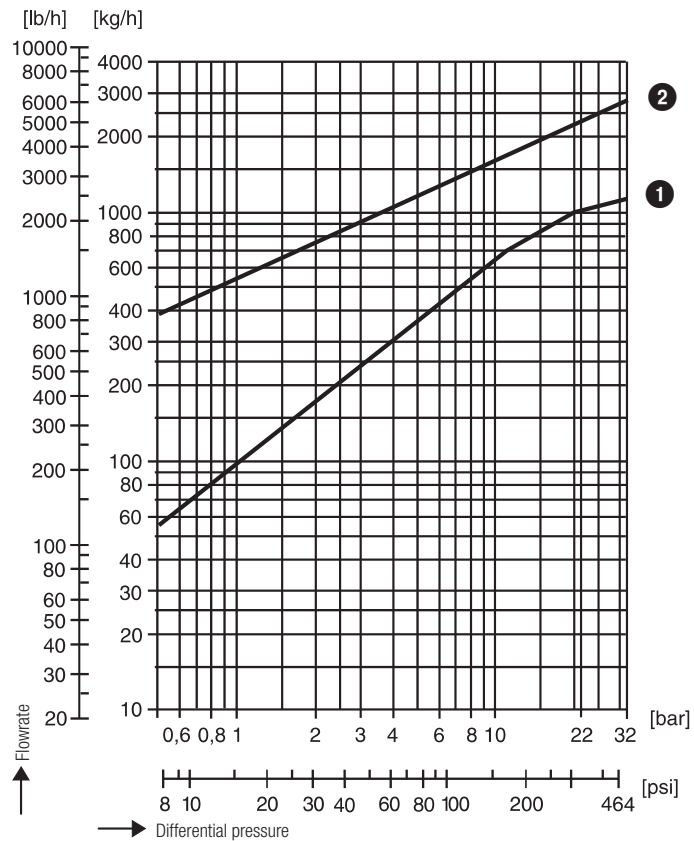
### Inspection & Certification

Documentation regarding material tests and in-house examination with test report EN10204 available. All inspection requirements have to be stated with the enquiry or order. After supply of the equipment certification cannot be established. Charges and extent of the above mentioned test certificates as well as the different tests confirmed therein are listed in our Price List "Test and Inspection Charges for Standard Equipment". For other tests and inspections than those listed above, please consult us.

### Capacity Chart for MK 45-1, MK 45A-1



### Capacity Chart for MK 45-2, MK 45A-2



### Directives and standards

You can find details on the conformity of the equipment and the applicable standards and directives in our Declaration of Conformity and the relevant certificates or approvals.

Supply in accordance with our general terms of business.

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