TESTING EQUIPMENT

Certificate

Standard **ISO 9001:2008**

Certificate Registr. No. 01 100 6435

TÜV Rheinland Cert GmbH certifies:

Certificate Holder:

EFCO Maschinenbau GmbH
Otto-Brenner-Straße 5-7
D - 52353 Düren

Scope: Development, Design and Manufacturing of repair and production machines as well as test installations for the stationary and mobile use for the repair and test of industrial valves

An audit was performed, Report No. 6435. Proof has been furnished that the requirements according to ISO 9001:2008 are fulfilled.
The due date for all future audits is 16-04 (dd.mm).

Validity: The certificate is valid from 2011-04-17 until 2014-04-16.
First certification 1996

2011-04-15

TÜV Rheinland Cert GmbH
Am Grauen Stein · 51105 Köln

DGA-ZM-58-95-00

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EFCO VALVE REPAIR EQUIPMENT

For detailed information see our Valve Repair Equipment Folder












Sub ect to technical change.

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Agencies in many countries

07/2009 – 01

PS-T/SV5

Portable valve test bench for testing safety valves

- DN10 (3/8) - DN80 (3)
- For testing safety valves
- For flanged and threaded valves
- Portable, vertical
- Test medium: air / nitrogen
- Max. test pressure:
  DN 10 (3/8) / 200 bar (2900 psi)
  DN 80 (3) / 50 bar (725 psi)
- Clear and uncomplicated operation
- Long life as only high-quality components are used

PS-T10

Portable valve test bench for testing safety and shut-off valves

- DN10 (3/8) – DN200 (8)
- For testing safety and shut-off valves
- For flanged and threaded valves
- Portable (3 parts), vertical
- Test medium: air / nitrogen / water
- Max. test pressure:
  DN 10 (3/8) / 200 bar (2900 psi)
  DN 200 (8) / 20 bar (290 psi)
- Clear and uncomplicated operation
- Long life as only high-quality components are used
- Water test pressure generation via finely ad ustable air-driven high pressure pump

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12/2009 – 01

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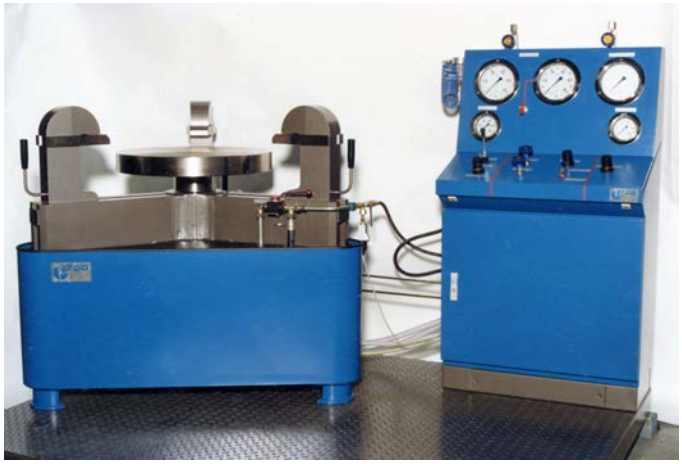
PS-15/ -30/ -50/ -75

Standard Valve Test Bench for Testing of Safety Valves and Shut-off / Control Valves

PS-15/-30/-50/-75 (with gantry)



PS-15/-30/-50/-75 (without gantry)

PS-15	PS-30	PS-50	PS-75
DN15 – DN250 (1/2) - (10)	DN25 – DN400 (500) (1) - (16 (20“))	DN25 – DN400 (500) (1) - (16 (20“))	DN25 – DN400 (500) (1) - (16 (20“))
For testing safety and shut-off valves and control valves			
For flanged, threaded and welded valves			
Clamping: stationary / vertical			
Test medium: air / nitrogen / water			
Hydraulic safety clamping system; prevents release of unit under test during pressurising			
Stainless steel water tank			
Test pressure generation via finely ad ustable air-driven filling and high pressure pumps			
Long life as only high-quality components are used			
Clear and uncomplicated operation			
DN15 (1/2) max.200bar (2900psi)	DN25 (1) max.200bar (2900psi)	DN25 (1) max.200bar (2900psi)	DN25 (1) max.200bar (2900psi)
DN250 (10) max.25bar (362psi)	DN400 (16) max.16bar (232psi)	DN400 (16) max.25bar (362psi)	DN400 (16) max.45bar (653psi)
	DN500 (20) max.10bar (145psi)	DN500 (20) max.20bar (290psi)	DN500 (20) max.30bar (435psi)

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PS-SV15 / -30 / -50

Valve test bench for testing safety valves

PS-SV15	PS-SV30	PS-SV50
DN15 (1/2) – DN250 (10)	DN25 (1) – DN400 (16)	DN25 (1) – DN400 (16)
For testing safety valves		
For flanged and threaded valves		
Clamping: stationary / vertical		
Test medium: air / nitrogen		
Hydraulic safety clamping system; prevents release of unit under test during pressurising.		
Long life as only high-quality components are used.		
Clear and uncomplicated operation		
DN15 (1/2) max.200bar (2900psi)	DN15 (1/2) max.200bar (2900psi)	DN15 (1/2) max.200bar (2900psi)
DN250 (10) max.25bar (362psi)	DN250 (10) max.45bar (653psi)	DN250 (10) max.80bar (1160psi)
	DN400 (16) max.20bar (290psi)	DN400 (16) max.30bar (435psi)

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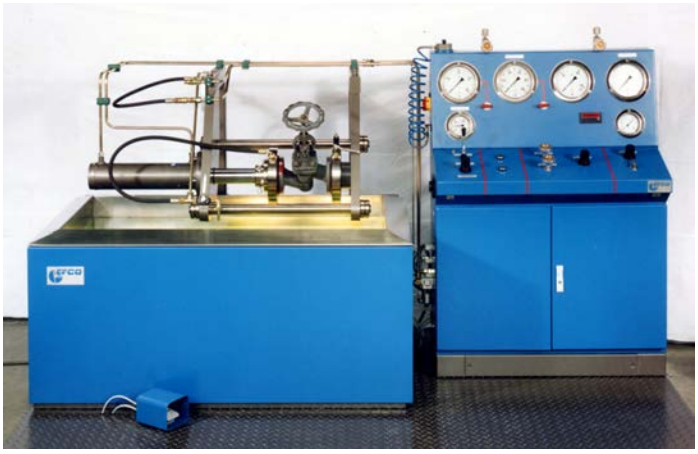
12/2009 – 01

PS-H10 UW

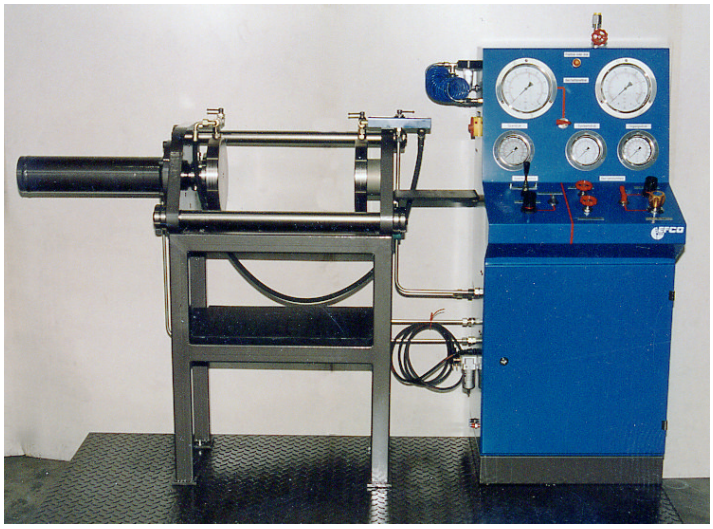
Horizontal valve test bench for immersion testing



- DN10 (3/8) – DN200 (8)
- For testing shut-off valves
- For flanged, threaded and welded valves
- Stationary, horizontal
- Immersion test with air
- Max. test pressure:
- DN 10 (3/8) / 200 bar (2900 psi)
  DN 200 (8) / 20 bar (290 psi)
- Hydraulic safety clamping system; prevents release of unit under test during pressurising.
- Stainless steel water tank
- Long life as only high-quality components are used
- Clear and uncomplicated operation

PS-H10

Horizontal valve test bench



- DN10 (3/8) – DN100 (4)
- For testing shut-off valves
- For flanged and threaded valves
- Stationary, horizontal
- Test medium: air / nitrogen
- Max. test pressure:
  DN 10 (3/8) / 200 bar (2900 psi)
  DN 100 (4) / 70 bar (1015 psi)
- Hydraulic safety clamping system; prevents release of unit under test during pressurising.
- Long life as only high-quality components are used
- Clear and uncomplicated operation

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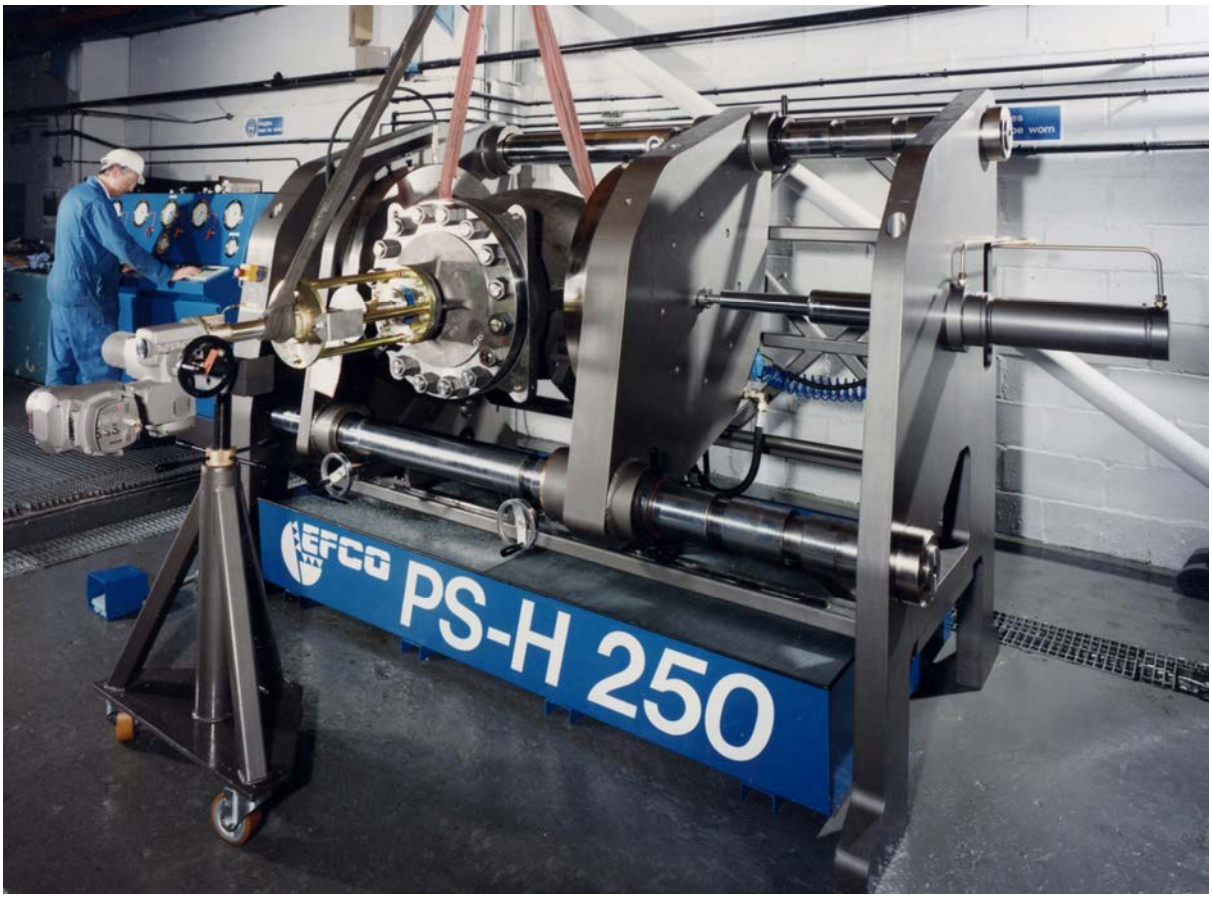
PS-H250

Large, horizontal valve test bench for testing shut-off and control valves



- DN100 (4) – DN1000 (40)
- For testing shut-off valves and control valves
- For flanged, threaded and welded valves
- Stationary, horizontal
- Test medium: air / water
- Max. test pressure: DN100 (4) / 200 bar (2900 psi) – DN1000 (40) / 25 bar (363 psi)
- Evacuation of valve to be tested for subsequent water test via built-in vacuum pump with water separator
- Clear and uncomplicated operation
- Proportional control to protect the housing against deformation.
  The clamping pressure is increased in proportion with the increase in test pressure.

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12/2009 – 02

PS-7.5A / -15A

Valve Test Bench with Automatic Test Cycle

PS-7.5A	PS-15A
DN15 (1/2") – DN250 (10")	
For **automatic** testing of shut-off valves (Siemens control)	
Short test cycles, fast retooling, clear and uncomplicated operation	
For flanged, threaded and welded valves	
Clamping: stationary / vertical	
Test medium: air / nitrogen / water	
DN15 (1/2") / max.60bar (870psi)	DN15 (1/2") / max.80bar (1160psi)
DN250 (10") / max.10bar (140psi)	DN250 (10") / max.20bar (290psi)

Subject to technical change.

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02/2012 – 02

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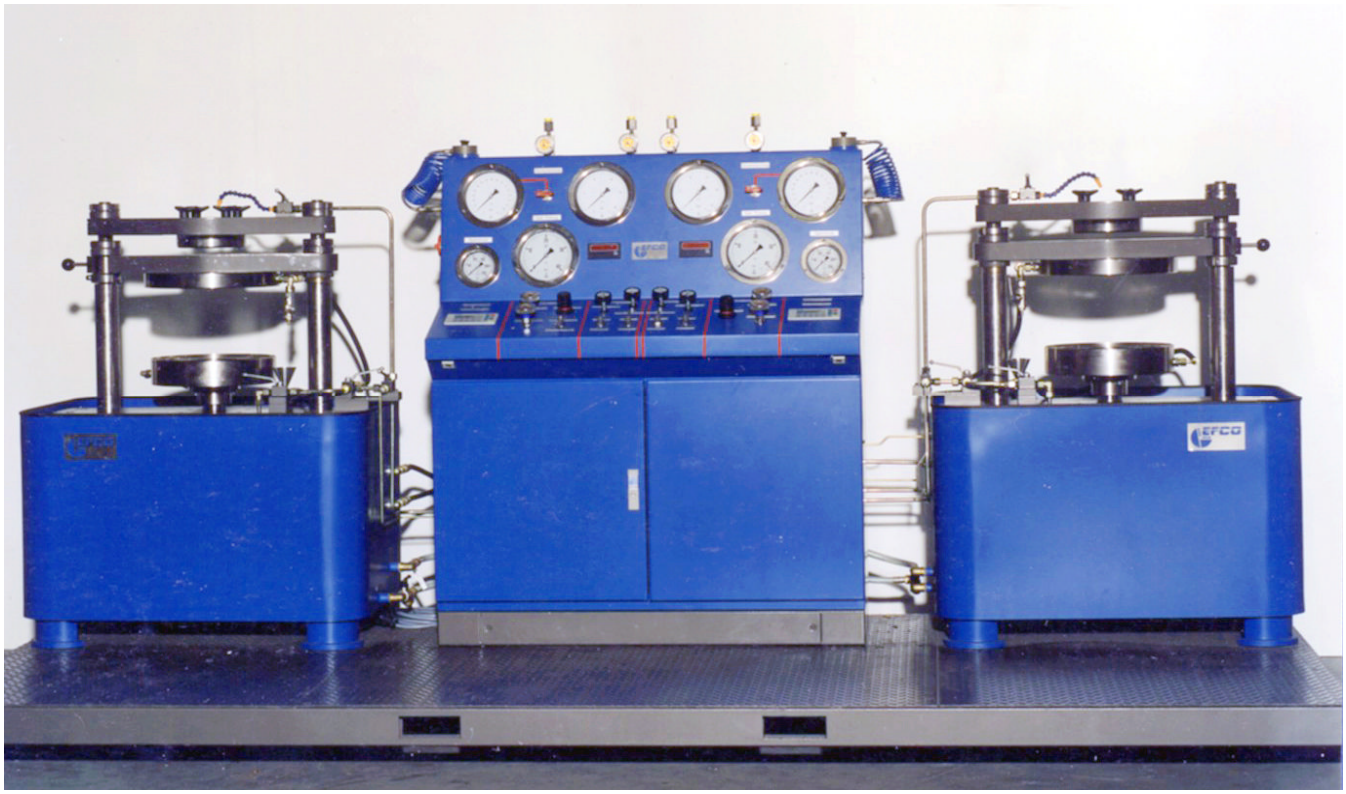
PS-15KL

Valve test bench with 2 clamping devices for testing check valves



- DN15 (1/2) – DN250 (10)
- Specifically for testing **check valves**
- Stationary / vertical
- Test medium: air / nitrogen / water
- Max. test pressure: DN15 (1/2) / 60 bar (870 psi) – DN250 (10) / 25 bar (363 psi)
- Test pressure generation via finely ad ustable air-driven filling and high pressure pumps
- Long life as only high-quality components are used.
- Clear and uncomplicated operation

Sub ect to technical change.

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12/2009 – 01

PS for Steam Traps

Double Test Stand with Automatic Test Cycle

- DN15 (1/2) – DN50 (2)
- With **automatic** test cycle (Siemens control)
- Twin unit for simultaneous testing of two test units
- Stationary
- Test medium: Water
- Max. test pressure: DN10 (1/2) – DN50 (2) / 240 bar (3480 psi)
- Short test cycles, quick retooling
- For testing fittings of various types
- Evacuation of item to be tested for subsequent water test via built-in vacuum pump with water separator
- Clear and uncomplicated operation
- Proportional control to protect the housing against deformation.
  The clamping pressure is increased in proportion with the increase in test pressure.

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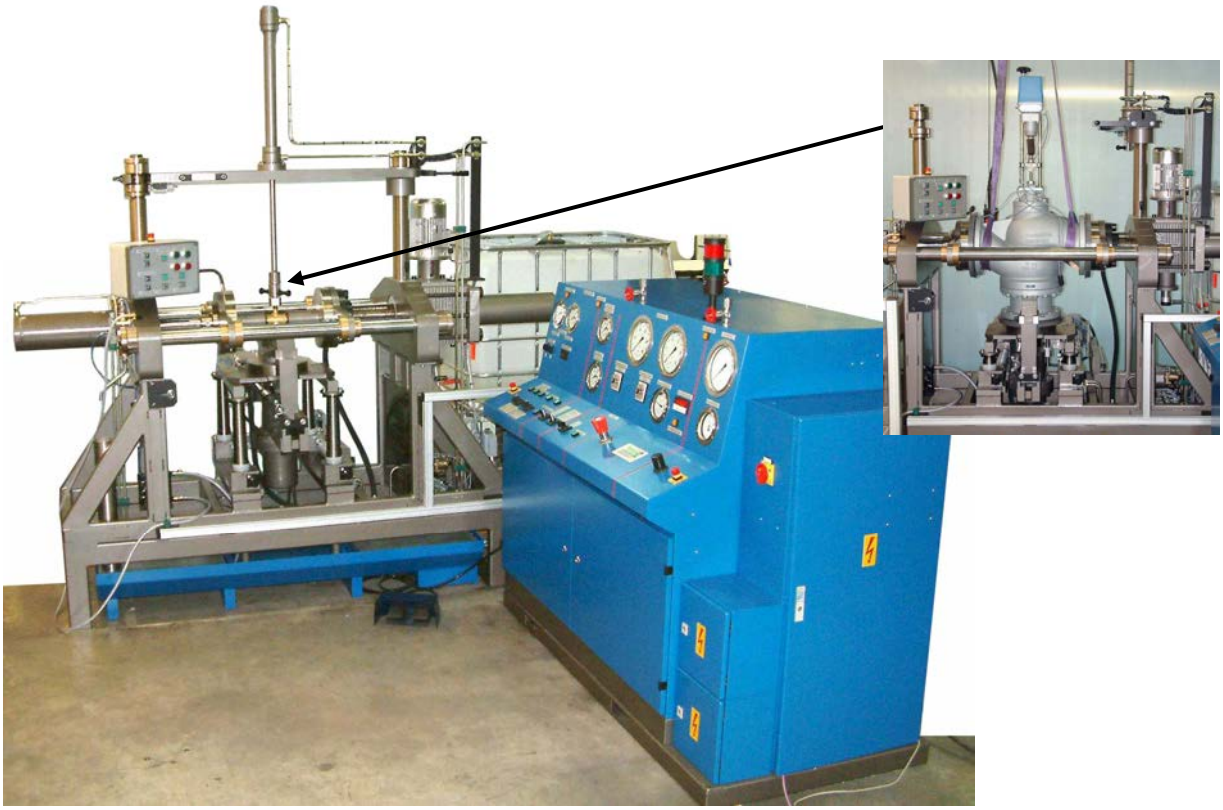
12/2009 – 01

PS for 3-way control valves

Valve Test Bench with Automatic Test Cycle



- DN15 (1/2) – DN200 (8)
- With **automatic** test cycle for 2 and 3 way control valves (Siemens control)
- For flanged and threaded valves
- Stationary
- Test medium: air / water
- Max. test pressure: DN15 (1/2) - DN200 (8“) / 60 bar (870 psi)
- Short test cycles, quick retooling
- Control of valves to be tested via their own drive or EFCO drive simulator
- For testing valves of various types
- Evacuation of valve to be tested for subsequent water test via built-in vacuum pump with water separator
- Clear and uncomplicated operation
- Proportional control to protect the valve body against deformation.
  The clamping pressure is increased in proportion with the increase in test pressure.

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12/2009 – 01

PS for Refrigerant Pumps

Test Bench with Automatic Test Cycle and Immersion Test

- With **automatic** test cycle (Siemens control)
- Immersion and air tests
- Stationary
- Test medium: air / oil
- Max. test pressure: 60 bar (870 psi)
- Short test cycles, quick retooling
- Evacuation of item to be tested for subsequent oil test via built-in vacuum pump with water separator
- Clear and uncomplicated operation

Sub ect to technical change.

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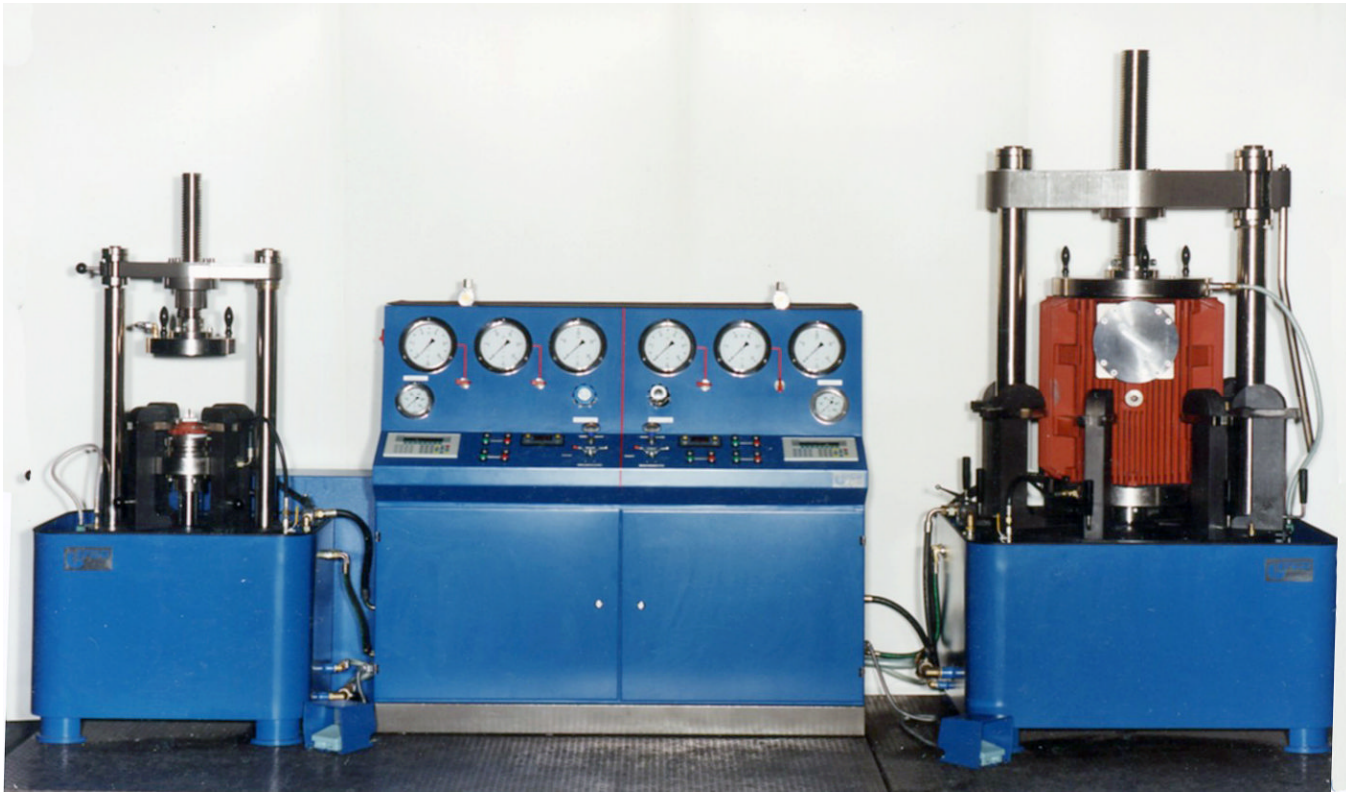
12/2009 – 01

PS for Electric Motor Housings

Test bench with 2 clamping units and automatic test cycle



- With **automatic** test cycle (Siemens control)
- Stationary
- Test medium: Water
- Max. test pressure: 30 bar (435 psi)
- Clear and uncomplicated operation
- Proportional control to protect the housing against deformation.
  The clamping pressure is increased in proportion with the increase in test pressure.
- Short test cycles, quick retooling

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PS for Pipe Bells

Stationary Test Bench for Pipe Fittings

- Bends / T-pieces / reducers DN100 (4) – DN700 (28)
- Stationary
- Test medium: Water
- Max. test pressure: 25 bar (363 psi)
- For testing fittings of various types
- Clear and uncomplicated operation

Sub ect to technical change.

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12/2009 – 01

PS for special angle shut-off valves

- DN10 (3/8) – DN100 (4)
- With twin clamping unit
- For flange fittings
- Immersion test
- Stationary
- Test medium: Air
- Max. test pressure: DN10 (1/2) / 100 bar (1450 psi) – DN100 (4) / 60 bar (870 psi)
- For testing fittings of various types
- Clear and uncomplicated operation

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Tensioner for Piston Actuators

- Mainly used to tension the piston actuator spring of valve actuators before subsequent installation in the cap
- DN80 (3) – DN300 (12)
- Tensioning power 7.5 t
- Stationary
- Long life as only high-quality components are used
- Clear and uncomplicated operation
- Short installation time, quick retooling

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Container Testing Equipment

- Portable container testing equipment for water pressure tests of pre-filled containers
- Standard pressures up to 400 bar and more
- Test pressure generation via finely ad ustable air-driven high pressure pump
- Long life as only high-quality components are used.

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BOE100/200 or /300
BOO100/200 or /300

High pressure generation; air/nitrogen booster

BOE 100/200 or /300

BOO 100/200 or /300

BOE100/200	BOE100/300	BOO100/200	BOO100/300
max. operating pressure 200 bar (2900 psi)	max. operating pressure 300 bar (4350 psi)	max. operating pressure 200 bar (2900 psi)	max. operating pressure 300 bar (4350 psi)
Tank volume 2 x 50 l (= 100 l)			
Compression of air/nitrogen			
Autom. switching off at max. operating pressure / autom. switching on in case of pressure drop			
Clear and uncomplicated operation			
Filling time for 100 l from 0 to 200 bar (2900 psi) 2.5 h approx.	Filling time for 100 l from 0 to 300 bar (4350 psi) 3.5 h approx.	Filling time for 100 l from 0 to 200 bar (2900 psi) 7-8 h approx.	Filling time for 100 l from 0 to 300 bar (4350 psi) 12-14 h approx.
Electric drive 400 VAC	Electric drive 400 VAC	Pneumatic drive 6-8 bar (90-100 psi)	Pneumatic drive 6-8 bar (90-100 psi)

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12/2009 – 02

PS Accessories / Options

Digital pressure gauge

Digital bubble counter

PS with **upright slewing crane**

- **Digital pressure gauge, particularly suitable for simple recording of measurements during the set pressure test of safety valves**
- **Digital bubble counter to automatically count bubbles during the seat leak test, using air**
- **Upright slewing crane**
- **Sealing adapter for threaded and welded fittings**
- **Test system piping made of stainless steel**
- **Clamping power up to 300 t and more**
- **Test pressure up to 1000 bar and more**
- **Loose flange closures to close any openings in test body**
- **Safety plugs, in particular for seat leakage test of safety valves using air**
- **Control of control valve drives**
- **Proportional control to reduce loading of item under test from clamping in test bench**

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EFCO Testing Equipment

(**Valve test benches** / Safety Valve Testing in Pipelines / Tank Testing / High-Pressure Generation / Test Documentation / Optional Accessories)

- superior quality - simple operation - many years' experience in the construction of test benches

EFCO VALVE TEST BENCHES

- Stationary / portable (particular for on-site use)
- Manual / automatic
- Horizontal / vertical clamping of test specimens
- Standard / modified or individual to customer requirements

Devices to be tested (with flange / threaded and weld ends)

- Gate valves, valves, check valves, control valves, ball valves, safety valves, housings, pipes, tanks

Test media

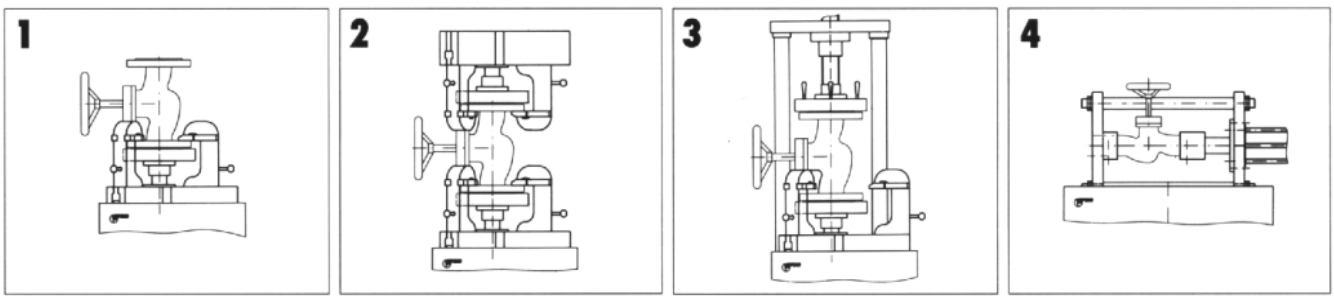
- Water, air, nitrogen, (oil)

Test types

- Strength test of housings, leakage test of spindle glands, leakage test of shut-off devices, set pressure of safety valves.

The above types of test can be carried out in accordance with
DIN 3230 ; DIN-EN 12266 ; API 598 ; API 6D ; ASME B16.34 ; ASME B16.104 and FCI 70-2

Clamping positions for valves



Selection from the standard range

DN	PS 7.5	PS-T 10	PS 15	PS 30	PS 50	PS 75	PS 100	PS 140	PS-H 250	PS-H350
mm (")	7.5 t*	10 t*	15 t*	30 t*	50 t*	75 t*	100 t*	140 t*	250 t*	350 t*
10 (3/8")	200	200			***max. test pressure (bar)***					
15 (1/2")	200	200	200	200	200	200				
25 (1")	200	200	200	200	200	200				
50 (2")	200	200	200	200	200	200				
100 (4")	60	70	100	200	200	200	200	200	200	200
150 (6")		35	55	110	180	200	200	200	200	200
200 (8")		20	30	65	110	165	200	200	200	200
250 (10")			25	45	80	120	160	200	200	200
400 (16")				20	30	50	70	90	160	200
500 (20")				10	20	30	40	50	100	140
600 (24")									70	100
800 (32")									40	60
Clamping positions	**1, 4**	**1**	**1, 3**	**1, 3**	**1, 3**	**1, 3**	**1, 2, 3**	**2**	**4**	**4**

***Tensioning power in t** ***Option** **(1bar = 0.1MPa = 1.02kg/cm^2 ≈ 14.5psi ≈ 14.5lb/in^2)**

Simple determination of tensioning power required using the tensioning power table

TENSIONING POWER TABLE

TEST PRESSURE (bar) (1bar = 0.1MPa = 1.02kg/cm^2 ≈ 14.5psi ≈ 14.5lb/in^2)

DN mm	A cm²	10	16	25	38	40	60	64	96	100	150	160	240	250	320	375	400	480	600	bar
15 (½")	8.04	80,4	128,6	201	306	322	482	515	772	804	1206	1286	1930	2010	2573	3015	3216	3899	4824	
20 (3/4")	8.04	80,4	128,6	201	306	322	482	515	772	804	1206	1286	1930	2010	2573	3015	3216	3899	4824	15t
25 (1")	8.04	302	438	755	1148	1208	1812	1933	2899	3020	4530	4832	7248	7550	9664	11325	12080	14647	18120	
32 (1 1/4")	30.2	302	438	755	1148	1208	1812	1933	2899	3020	4530	4832	7248	7550	9664	11325	12080	14647	18120	
40 (1 ½")	30.2	302	438	755	1148	1208	1812	1933	2899	3020	4530	4832	7248	7550	9664	11325	12080	14647	18120	
50 (2")	30.2	302	438	755	1148	1208	1812	1933	2899	3020	4530	4832	7248	7550	9664	11325	12080	14647	18120	30t
65 (2 ½")	66.4	664	1062	1660	2523	2656	3984	4250	6374	6640	9960	10624	15936	16600	21248	24900	26560	32204	39840	
80 (3")	66.4	664	1062	1660	2523	2656	3984	4250	6374	6640	9960	10624	15936	16600	21248	24900	26560	32204	39840	50t
100 (4")	115	1150	1840	2875	4370	4600	6900	7360	11040	11500	17250	18400	27600	28750	36800	43125	46000	55775	69000	100t
125 (5")	169.6	1696	2714	4240	6445	6784	10176	10854	16282	16960	25440	27136	40704	42400	54272	63600	67840	82256	101760	140t
150 (6")	246	2460	3936	6150	9348	9840	14760	15744	23616	24600	36900	39360	59040	61500	78720	92250	98400	119310	147600	
200 (8")	404.5	4045	6472	10113	15371	16180	24270	25888	38832	40450	60675	64720	97080	101125	129440	151688	161800	196183	242700	
250 (10")	547	5470	8752	13675	20786	21880	32820	35008	52512	54700	82050	87520	131280	136750	175040	205125	218800	265295	328200	
300 (12")	824	8240	13184	20600	31312	32960	49440	52736	79104	82400	123600	131840	197760	206000	263680					
350 (14")	1104	11040	17664	27600	41952	44160	66240	77656	105984	110400	165600	176640	264960	276000	353208					
400 (16")	1385	13850	22160	34625	52630	55400	83100	88640	132960	138500	207750	221600	332400	346250						
500 (20")	2247	22470	35952	56175	85386	89880	134820	143808	215712	224700	337050	359520	539280	561750						
600 (24")	3116	31160	49856	74900	118408	124640	186960	199424	299136	311600	467400	498560	747840							
700 (28")	4183	41830	66928	104575	158954	167320	250980	267712	401568	418300	627450	669280								
800 (32")	5408	54080	86528	135200	205504	216320	324480	346112	519168	540800	811200									
900 (36")	6793	67930	108688	169825	258134	271720	407580	434752	652128											
1000 (40")	8333	83330	133328	208325	316654	333320	499980													

TENSIONING POWER (daN*)

* 1000 daN corresponds to about 1 t

Sub ect to technical change.

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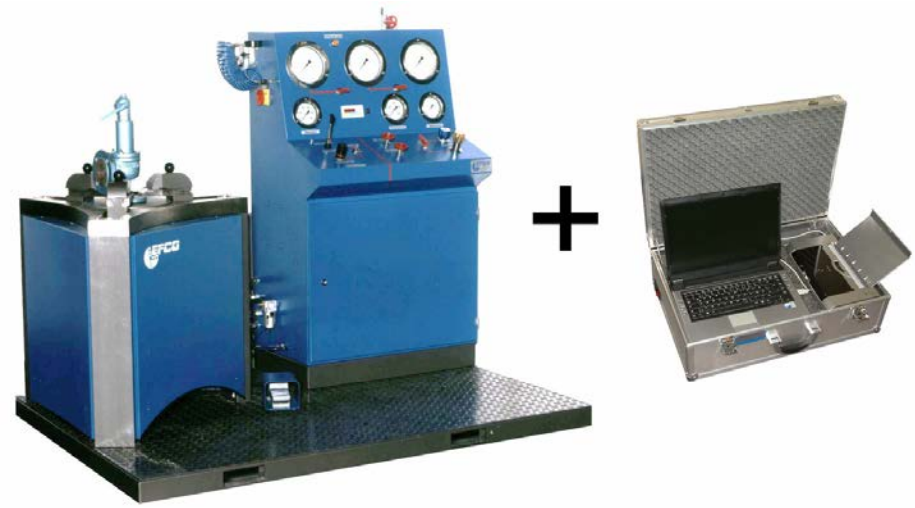
Agencies in many countries

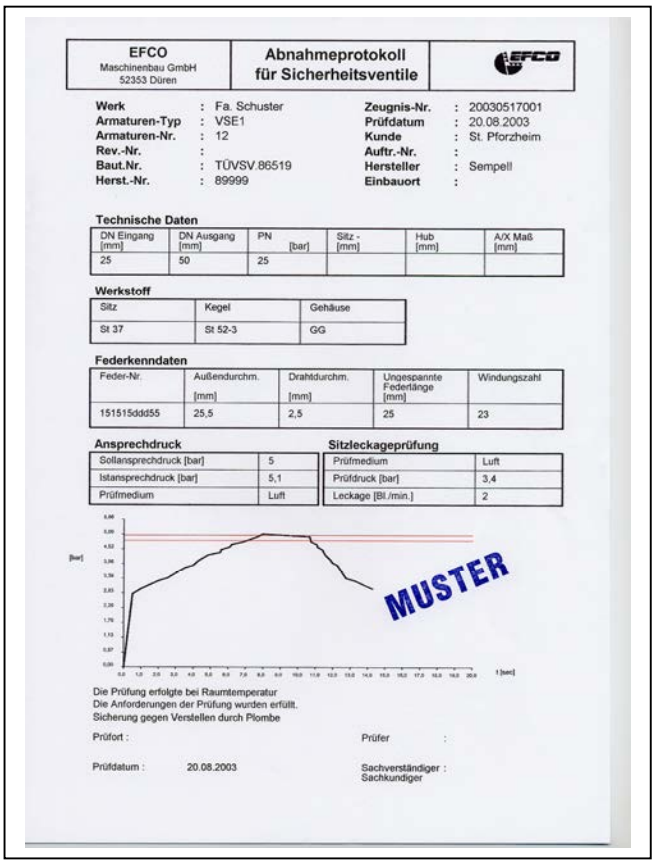
12/2009 – 02

VALVE-DOC

Documentation and Administration System

- Mobile workstation, suitable for workshops, for the administration and documentation of tests
- Testing of set pressure and seating leakage of safety valves
- Housing and seating leakage tests of shut-off valves and control valves
- Valve ob card to record all work carried out





EFCO
Maschinenbau GmbH
52353 Düren

Abnahmeprotokoll für Sicherheitsventile

Werk	: Fa. Schuster	**Zeugnis-Nr.**	: 20030517001
Armaturen-Typ	: VSE1	**Prüfdatum**	: 20.08.2003
Armaturen-Nr.	: 12	**Kunde**	: St. Pforzheim
Rev.-Nr.	:	**Auftr.-Nr.**	:
Baut.Nr.	: TÜVSV.86519	**Hersteller**	: Sempell
Herst.-Nr.	: 89999	**Einbauort**	:

Technische Daten

DN Eingang [mm]	DN Ausgang [mm]	PN [bar]	Sitz - [mm]	Hub [mm]	A/X Maß [mm]
25	50	25			

Werkstoff

Sitz	Kegel	Gehäuse
St 37	St 52-3	GG

Federkenndaten

Feder-Nr.	Außendurchm. [mm]	Drahtdurchm. [mm]	Ungespannte Federlänge [mm]	Windungszahl
151515ddd55	25,5	2,5	25	23

Ansprechdruck

Sollansprechdruck [bar]	5
Istansprechdruck [bar]	5,1
Prüfmedium	Luft

Sitzleckageprüfung

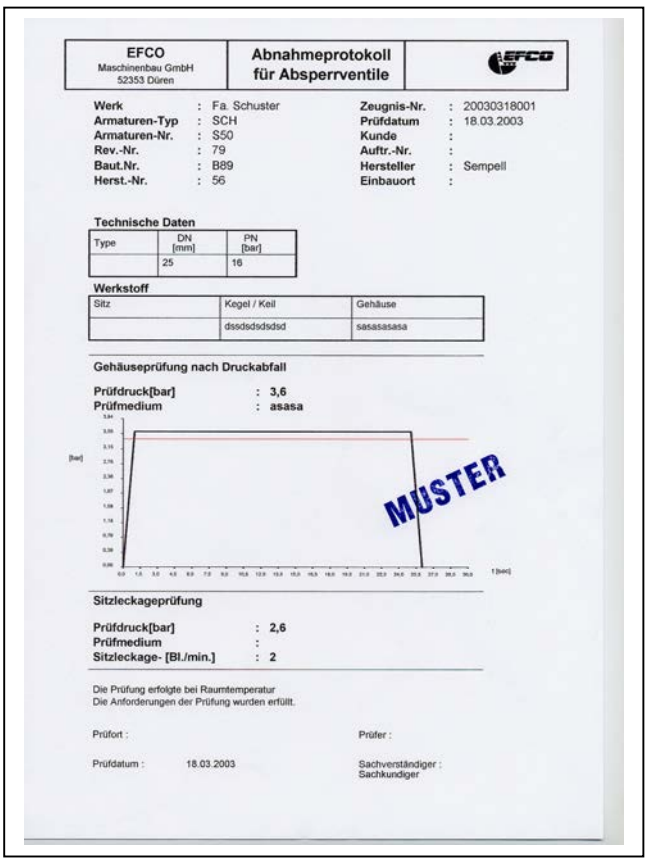
Prüfmedium	Luft
Prüfdruck [bar]	3,4
Leckage [Bl./min.]	2

MUSTER

Die Prüfung erfolgte bei Raumtemperatur
Die Anforderungen der Prüfung wurden erfüllt.
Sicherung gegen Verstellen durch Plombe

Prüfort :
Prüfer :
Prüfdatum : 20.08.2003
Sachverständiger : Sachkundiger

Acceptance certificate for safety valves



EFCO
Maschinenbau GmbH
52353 Düren

Abnahmeprotokoll für Absperrventile

Werk	: Fa. Schuster	**Zeugnis-Nr.**	: 20030318001
Armaturen-Typ	: SCH	**Prüfdatum**	: 18.03.2003
Armaturen-Nr.	: S50	**Kunde**	:
Rev.-Nr.	: 79	**Auftr.-Nr.**	:
Baut.Nr.	: B89	**Hersteller**	: Sempell
Herst.-Nr.	: 56	**Einbauort**	:

Technische Daten

Type	DN [mm]	PN [bar]
	25	16

Werkstoff

Sitz	Kegel / Keil	Gehäuse
	dssdsdsdsdsd	sasasasasa

Gehäuseprüfung nach Druckabfall

Prüfdruck[bar] : **3,6**
Prüfmedium : **asasa**

MUSTER

Sitzleckageprüfung

Prüfdruck[bar] : **2,6**
Prüfmedium :
Sitzleckage- [Bl./min.] : **2**

Die Prüfung erfolgte bei Raumtemperatur
Die Anforderungen der Prüfung wurden erfüllt.

Prüfort :
Prüfer :
Prüfdatum : 18.03.2003
Sachverständiger : Sachkundiger

Acceptance certificate for shut-off valves

- Complete pre-installed operational system
  Unpack - plug in - run test

- Can be supplied with an EFCO valve test bench or can be retrofitted to all EFCO valve test benches as well as to all other makes

- Available in many foreign languages

- Operating system – Windows P

Sub ect to technical change.

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Agencies in many countries

12/2009 – 03

C h e c k l i s t (for Test Benches)

EFCO Maschinenbau GmbH – Valve repair and testing equipment
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Company name: ..... Date: .....
..... Phone.: .....
Contact person: ..... E-mail.: .....

Information on the type of valves which have to be tested ?

- Shut-off valves and regulating valves -

Valve type: ☐ Gate valves ☐ Valves ☐ Ball valves
☐ Butterfly valve ☐ Return flaps (flat trap) ☐ Control valves
☐ Others (please describe here) .....

Valve end has/is: ☐ Flange ☐ Butt-welded ☐ threads ☐ Other (please describe here)....

Valve shape: - 2-Way - ☐ Straight form ☐ Angular form
☐ Other (please describe here or provide drawing).....

What kind of tests have to be done and what is the test medium?

Body tests ☐ Water ☐ Air (LP 6bar (87 psi))
Seat leakage: ☐ Water / ☐ Air (LP 6bar (87 psi))/ ☐ Air/Nitrogen(HP)
☐ Other tests (please describe here).....

LP=Low Pressure ; HP=High Pressure

Test pressures: DN size and the maximum test pressure for exactly this DN size.
(you should only indicate DN sizes and test pressures according to your main programme. Exceptions (sizes/pressures) can increase the price of the test bench and its accessories very much!)

max. testpressure using **water** (bar or psi) *Please fill in!*

valve size	**bar**	**psi**		**bar**	**psi**		**bar**	**psi**
DN10 (3/8“)			DN80 (3“)			DN350 (14“)		
DN15 (½“)			DN100 (4“)			DN400 (16“)		
DN20 (3/4“)			DN125 (5“)			DN500 (20“)		
DN25 (1“)			DN150 (6“)			DN600 (24“)		
DN32 (1 ¼“)			DN200 (8“)			DN700 (28“)		
DN40 (1 ½“)			DN250 (10“)			DN800 (32“)		
DN50 (2“)			DN300 (12“)					
DN65 (2 ½“)								

max. test pressure using **air/nitrogen** (bar or psi) *Please fill in!*

valve size	bar	psi		bar	psi		bar	psi
DN10 (3/8“)			DN80 (3“)			DN350 (14“)		
DN15 (½“)			DN100 (4“)			DN400 (16“)		
DN20 (3/4“)			DN125 (5“)			DN500 (20“)		
DN25 (1“)			DN150 (6“)			DN600 (24“)		
DN32 (1 ¼“)			DN200 (8“)			DN700 (28“)		
DN40 (1 ½“)			DN250 (10“)			DN800 (32“)		
DN50 (2“)			DN300 (12“)					
DN65 (2 ½“)								

C h e c k l i s t (for Test Benches)

- *Safety Valves* -

Valve end has/is: ☐ Flange ☐ Threads ☐ Other (please describe here).....

Valve shape: ☐ Straight form ☐ Angular Form

Kind of tests have to be done at the safety valve and what is the test medium?

Set pressure tests using	☐ Water / ☐ Air/Nitrogen (HP)
Seat leakage tests using	☐ Water / ☐ Air/Nitrogen (HP)
☐ Other tests (please describe)	

HP = High Pressure

Test pressures: DN size and the maximum test pressure for exactly this DN size.
(you should only indicate DN sizes and test pressures according to your main programme. Exceptions (sizes/pressures) can increase the price of the test bench and its accessories very much!)

max. test pressure using **water** (bar or psi) *Please fill in!*

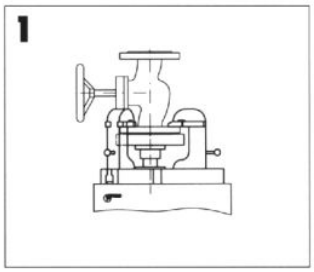
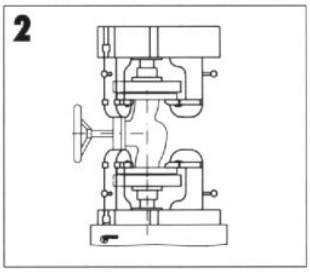
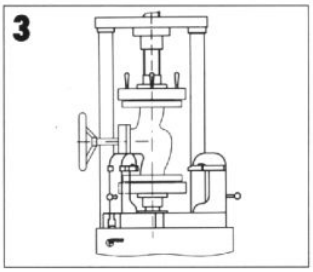
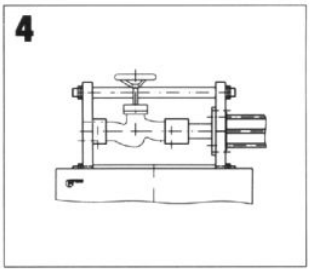
valve size	bar	psi		bar	psi		bar	psi
DN10 (3/8“)			DN80 (3“)			DN350 (14“)		
DN15 (½“)			DN100 (4“)			DN400 (16“)		
DN20 (3/4“)			DN125 (5“)			DN500 (20“)		
DN25 (1“)			DN150 (6“)			DN600 (24“)		
DN32 (1 ¼“)			DN200 (8“)			DN700 (28“)		
DN40 (1 ½“)			DN250 (10“)			DN800 (32“)		
DN50 (2“)			DN300 (12“)					
DN65 (2 ½“)								

max. test pressure using **air/nitrogen** (bar or psi) *Please fill in!*

valve size	bar	psi		bar	psi		bar	psi
DN10 (3/8“)			DN80 (3“)			DN350 (14“)		
DN15 (½“)			DN100 (4“)			DN400 (16“)		
DN20 (3/4“)			DN125 (5“)			DN500 (20“)		
DN25 (1“)			DN150 (6“)			DN600 (24“)		
DN32 (1 ¼“)			DN200 (8“)			DN700 (28“)		
DN40 (1 ½“)			DN250 (10“)			DN800 (32“)		
DN50 (2“)			DN300 (12“)					
DN65 (2 ½“)								

C h e c k l i s t (for Test Benches)

What kind of valve Clamping is required/preferred ?

1	2	3	4
			
Unilateral clamping of flanged valves using claws	Bilateral clamping of flanged valves using claws	Unilateral clamping of flanged valves using claws or clamping of flanged or and butt-welded valves between two tables (Test bench with upper clamping yoke)	Horizontal Clamping of flanged valves and butt-welded valves between two tables (Horizontal test bench)
Applicable Clamping forces 7,5t - 150t	Applicable Clamping forces 100t - 150t	Applicable Clamping forces 15t - 150t ✸	Applicable Clamping forces 5 - 75t Clamp. forces 100t - 550t ✸ Clamp. force 600t-1500t ✸
☐	☐	☐	☐

✸ ***To avoid damages due to deformation of the test valve during the test our test benches with clamping forces of more than 75 tons are furnished with a proportional clamping control function***

Gauge readings preferred ?

Reading: ☐ bar ☐ psi ☐ bar/psi ☐ MPa ☐ kg/cm²

Available energy resources available on place of test bench installation ?

Air: .....bar

Electricity ☐ 110VAC/60Hz ☐ 230VAC/50Hz ☐ 400VAC/50Hz

☐ Other (please note) …….....

What options are required ?

- ☐ Digital Bubble counter (bubbles/minute) for seat leakage tests using air/nitrogen
- ☐ Separate Air compressor for pressures up to 200 bar (2900 psi) (=Air Booster)
- ☐ Separate Air compressor for pressures higher than 200 bar (2900 psi) (=Air Booster) The pressure required is ……. bar (….. psi)
- ☐ Digital displays with peak value storage function for the measured highest pressure (=set pressure of safety valves), including suitable pressure transducer
- ☐ Display of test result via PC and print out of a test reports
- ☐ Piping and bolting made of non-rusting steel
- ☐ Instruction manual and Machine labels in other language than German or English: Language required is:.....
- ☐ Further requirements (Please describe)…….....

…….

…….

…….

YOUR PARTNER WORLDWIDE

EFCO Modular Test Benches

- The new generation of valve test benches -

Their modular design allows:

- A wide range of variants
- Proven quality at a lower price
- Shorter delivery times
- Easier transportation thanks to compact form

EFCO Modular Test Benches

A fundamental redesign of the previous model series PS and PS-SV-15/30/50/75 has led to the emergence of the new model ranges:

- **PS-15M/30M/50M/75M** for testing shut-off valves and safety valves
  Basic version: Air – max. 6 bar / Water – max. 350 bar
  Optional: Air / nitrogen – max. 200 bar or max. 300 bar

- **PS-SV15M/30M/50M/75M** for testing safety valves with air/nitrogen
  Basic version: Air / nitrogen – max. 200 bar
  Optional: Air / nitrogen – max. 300 bar

Standardisation of components, multiple usage of components and a variety of technical modifications have enabled the development of new, more affordable model ranges with many optional features.

This now allows us to offer our customers a ***MORE COST-EFFECTIVE*** solution with considerably ***SHORTER DELIVERY TIMES***.

New console design

- Control console with modular design
- Sheet-steel construction standardised throughout the range
- Extremely well protected against corrosion thanks to powder coating
- Brushed stainless-steel front panels with language-independent operator symbols
- High-quality manometer including acceptance test certificates
- High-quality controls

The manometer supports all the following units of pressure: bar/psi (basic version), MPa, kg/cm², psi

New modular test benches - model series

Modular test bench (PS) for testing *shut-off and safety valves* with air / nitrogen and water

Modular test bench (PS-SV) for testing *safety valves* with air / nitrogen

	PS 15M	PS-SV 15M	PS 30M	PS-SV 30M	PS 50M	PS-SV 50M	PS 75M	PS-SV 75M
DN range	15 – 250 (1//2) - (10)		25 – 400 (1) - (16)		25 – 400 (1) - (16)		25 – 400 (1) - (16)	
Clamping force	15t		30t		50t		75t	
Max. test pressure for:	Max. test pressure in bar (1 bar = 0.1 MPa = 1.02 kg/cm^2 ≈ 14.5 psi ≈ 14.5 lb/in^2)							
DN15 (1/2)	300 350	300						
DN25 (1)	300 350	300	300 350	300	300 350	300	300 350	300
DN50 (2)	300 350	300	300 350	300	300 350	300	300 350	300
DN80 (3)	205 205	205	300 350	300	300 350	300	300 350	300
DN100 (4)	115 115	115	235 235	300	300 350	300	300 350	300
DN150 (6)	55 55	55	110 110	110	180 180	180	275 275	275
DN200 (8)	30 30	30	65 65	65	110 110	110	165 165	165
DN250 (10)	20 20	20	45 45	45	80 80	80	120 120	120
DN400 (16)			15 15	15	30 30	30	45 45	45

= Air / nitrogen = Water

Options and accessories:

- Pipes and screw fittings for the test bench in stainless steel
- Versions for max. 200 bar or max. 300 bar air / nitrogen
- Digital bubble counter, automatically counting air bubbles in the seat leakage test with air
- Digital manometers with facility to store peak value, especially for trip testing of safety valves (water / air)
- Protective barrier
- Safety plugs for testing safety valves
- Adaptors for weld-in valves
- Adaptors for threaded valves
- Drive controller for control valves
- Bubble accumulator for testing safety valves with water
- Facility to ad ust water test pressure in the lower pressure range

EFCO-VALVE-DOC ▷

- Mobile workstation for managing and documenting tests, suitable for workshops
- Tests trip pressure and seat leakage in safety valves
- Leakage tests for housings and seats in shut-off and control valves
- Valve operation card for recording all operations performed
- Can be supplied with an EFCO valve test bench or installed separately at a later time

◁ EFCO-ELEKTRO-BOOSTER

- For compressing air to 300 bar (4350 psi) (or to even higher pressures on request)
- Switches off automatically at max. operating pressure / switches on automatically if the pressure falls
- Clear and straightforward for user to operate

Sub ect to technical changes

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06/2010 – 00

YOUR PARTNER WORLDWIDE

EFCO valve test benches for production

As well as manually operated valve test benches that are mainly designed for the service area, for many years EFCO has been building an increasing number of valve test benches that are adapted to the special requirements of manufacturing companies.

EFCO valve test benches fit into your manufacturing process in an optimum way, and are the guarantee of reliable final inspections.

From initial inquiry to comprehensive after-sales service,

EFCO is at your side all the way.

CE

www.tuv.com TÜVRheinland ID:0091006435

The demands that are made of the nature and scope of testing can be as varied as your product itself.

Extract of the wide range of applications / designs of an EFCO manufacturing test stand

Type of test piece:	Gate valves, seat valves, ball valves, control valves, shut-off valves, check valves, steel gaiters, containers, pipes, connecting sleeves, pump housings, motor housings, steam traps
Test piece design:	Through valves, corner valves, two-way valves, three-way valves
Test piece clamping:	Horizontal / vertical / tilting - Individually clamped / multiple clamping
Testing:	- Pressure testing: Water / air / gas / oil testing Housing tightness testing / seat tightness testing - Test pressures: Water pressure up to 1380 bar (higher on request) Air / nitrogen pressure up to 300 bar (higher on request) Air / nitrogen pressure also for underwater testing - Flow rate measurement (especially with control valves) - Closing torque testing (especially with powered ball valves) - Degree of automation: Manual / semi-automatic / fully automatic
Documentation:	Documentation of the main test results

Extract of previous projects

△

PS-H 1500

- DN 65 (2½) - DN 500 (20) – gate valves, flanged vales and weld-in valves
- Air test max. 280 bar / water test max. 1380 bar
- Low-stress horizontal clamping using differential piston adapter
- Semi-automatic test procedure

PS for 2 and 3-way control valves

- DN 15 (1/2) - DN 200 (8)
- Flanged and threaded valves
- Air test 6-7 bar
- Water test max. 60 bar
- Short test cycles, quick changeovers, clear and uncomplicated user operation
- Test pieces actuated via self-propulsion or EFCO drive simulator
- Test piece evacuated before water test
- Test piece clamped with proportional control, i.e. clamping pressure is controlled proportionally to test pressure without housing deformation)
- Fully automatic test procedure

PS-7,5A / PS-15A

- DN 15 (1/2) - DN 250 (10)
- Seat valves
- Flanged, threaded and weld-in valves
- Air test 6-7 bar
- Water test max. 80 bar
- Short test cycles, quick changeovers, clear and uncomplicated user operation
- Vertical clamping
- Fully automatic test procedure

PS-50 UW

- DN 50 (2) - DN 200 (8)
- Flanged valves
- Air test (under water) max. 44 bar
- Water test max. 250 bar
- Short test cycles, quick changeovers, clear and uncomplicated user operation
- Test piece evacuated for subsequent water test
- Tiltable clamping (horizontal and vertical)
- Semi-automatic test procedure

PS flame arrester

- DN 25 (1) – DN 250 (10)
- Flanged valves
- Air test 0.5 bar
- Water test max. 25 bar
- Short test cycles, quick changeovers, clear and uncomplicated user operation
- Vertical clamping

PS gaiter testing device

- DN 25 (1) – DN 250 (10)
- Air test 6-7 bar
- Short test cycles, quick changeovers, clear and uncomplicated user operation
- Vertical clamping – 3-way
- Fully automatic test procedure

PS-H 7,5UW-A

- DN 15 (1/2) - DN 80 (3)
- Ball valves
- Flanged valves
- Air test (under water) max. 30 bar
- Torque test max. 100 Nm
- Short test cycles, quick changeovers, clear and uncomplicated user operation
- Horizontal clamping (valve under water)
- Semi-automatic test procedure

EFCO-Maschinenbau GmbH
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