Series 240
Type 3241-1 and Type 3241-7 Pneumatic Control Valves
Type 3241 Globe Valve

Application

Control valve for process engineering and industrial applications

Nominal size	**DN 15 to 300**
Nominal pressure	**PN 10 to 40**
Temperatures	**–196 to 450 °C**

Type 3241 Globe Valve operated with
- Type 3271 Pneumatic Actuator (Type 3241-1 Control Valve) or
- Type 3277 Pneumatic Actuator (Type 3241-7 Control Valve)

Valve body made of
- Cast iron
- Spheroidal graphite iron
- Cast steel, cast stainless steel or cast cold-resisting steel
- Forged steel or forged stainless steel
- Special materials

Undivided valve bonnet up to DN 150

Valve plug
- Metal seal
- Soft seal
- High-performance metal seal

The control valves, designed according to the modular assembly principle, can be equipped with various accessories:

Positioners, limit switches, solenoid valves and other accessories according to IEC 60534-6-1 and NAMUR recommendation. Refer to Information Sheet ▶ T 8350 EN for more details.

Versions

Standard version for temperatures ranging from –10 to 220 °C

– **Type 3241-1** (Figs. 1 and 3) · DN 15 to 300 with Type 3271 Pneumatic Actuator (see ▶ T 8310-1 EN, ▶ T 8310-2 EN, ▶ T 8310-3 EN)

– **Type 3241-7** (Fig. 2) · DN 15 to 150 with Type 3277 Pneumatic Actuator for integral positioner attachment (see ▶ T 8310-1 EN)

Further versions

– **Welding ends**

– **Adjustable packing** · See Information Sheet ▶ T 8000-1 EN

– **Flow divider or AC-1/AC-2 Trim** for noise reduction · See ▶ T 8081 EN and ▶ T 8082 EN

– **Perforated plug** · See ▶ T 8086 EN

– **Valve plug with pressure balancing** · See Technical data

– **Insulating section or bellows seal** · See Technical data

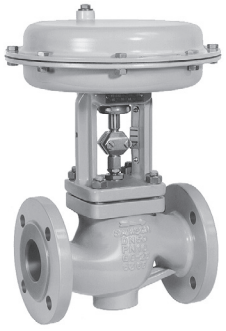


Fig. 1: *Type 3241-1 DN 15 to 150*

Fig. 2: *Type 3241-7 DN 15 to 80, forged steel*

Fig. 3: *Type 3241-1 DN ≥ 200*

– **Heating jacket** · On request

– **Stainless steel actuator** · See ▶ T 8310-1 EN

– **Additional handwheel** · See ▶ T 8310-1 EN, ▶ T 8310-2 EN, ▶ T 8310-3 EN

– **Type 3241 PSA** · Version for pressure swing adsorption plants · See ▶ T 8015-1 EN, ▶ T 8012-1 EN

– **Typetested version** · For heating systems (see ▶ T 8016 EN), DIN/DVGW-tested version for gas (see ▶ T 8020 EN) or liquid fuels and liquefied petroleum gas in the liquid phase (see ▶ T 8022 EN)

Associated Information Sheet	**T 8000-x EN**
Associated Data Sheets for pneumatic actuators	**T 8310-1 EN to T 8310-3 EN**

Edition November 2013

Data Sheet **T 8015 EN**

– **ANSI version** · See ▶ T 8012 EN
– **Versions with dimensions according to Japanese Industry Standard (JIS)** · Details on request

Principle of operation

The medium flows through the valve in the direction indicated by the arrow on the body. The valve plug position determines the cross-sectional area between the seat and plug.

Fail-safe position

Depending on how the springs are arranged in the pneumatic actuator (see ▶ T 8310-1 EN and ▶ T 8310-2 EN), the valve has two different fail-safe positions effective upon air supply failure.

– **Actuator stem extends (FA)**
  The valve closes when the supply air fails.
– **Actuator stem retracts (FE)**
  The valve opens when the supply air fails.

Differential pressures

Permissible differential pressures are listed in Information Sheet ▶ T 8000-4 EN.

Note

Fig. 4 to Fig. 6 show configuration examples.

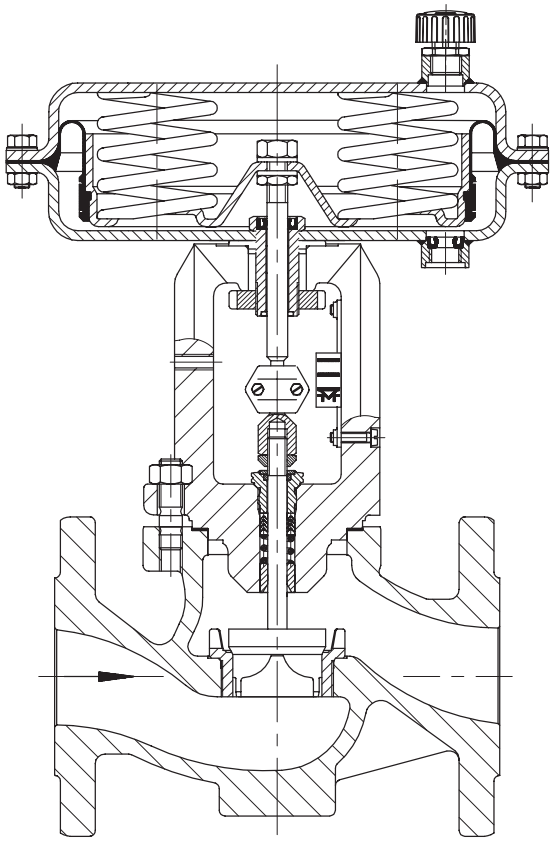


Fig. 4: *Type 3241-1 Control Valve, DN 15 to 150, with Type 3271 Actuator*

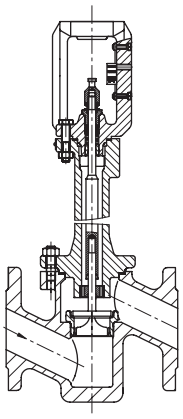


Fig. 5: *Type 3241 Valve, forged steel version, DN 15 to 80, with insulating section*

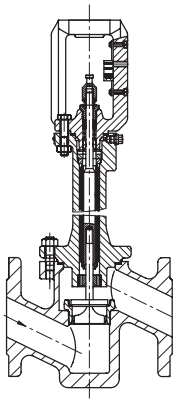


Fig. 6: *Type 3241 Valve, forged steel version, DN 15 to 80, with bellows seal*

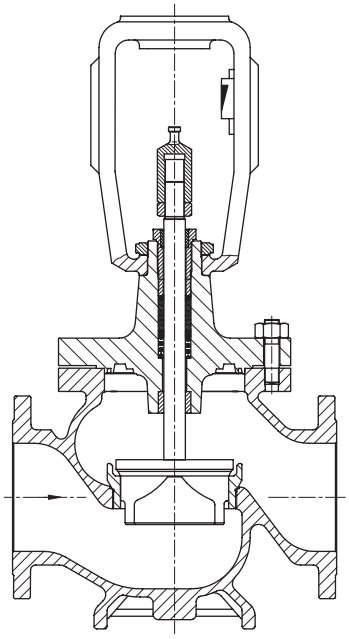


Fig. 7: *Type 3241 Valve, DN 200 to 300*

Table 1: *Technical data for Type 3241*

Nominal size	**DN**	**15 to 250**	**15 to 150**	**15 to 300**				**15 · 25 · 40 · 50 · 80**	
Material		Cast iron EN-JL1040	Spheroidal graphite iron EN-JS1049	Cast steel 1.0619	Cast stainless steel 1.4408	Cast steel 1.6220/ 1.1138	Cast stainless steel 1.4308	Forged steel 1.0460	Forged stainless steel 1.4571
Nominal pressure	PN	10 · 16	16 · 25	10 · 16 · 25 · 40					
Type of end connection	Flanges	All DIN versions							
	Welding ends	–		DIN EN 12627 only for DN 25, 40, 50, 80, 100, 150, 200, 250, 300				–	
Seat/plug seal		Metal seal · Soft seal · High-performance metal seal							
Characteristic		Equal percentage · Linear (according to Information Sheet ▶T 8000-3 EN)							
Rangeability		50:1 for DN 15 to 50 · 30:1 for DN 65 to 150 · 50:1 for DN 200 and larger							
Heating jacket	Up to DN 100	PN 25							
	DN 125 and higher	PN 16							
Temperature ranges in °C · Permissible operating pressures acc. to pressure-temperature diagrams (see Information Sheet ▶T 8000-2 EN)									
Body without insulating section		–10 to 220 °C							
Body with Insulating section	Short	–10 to 300	–10 to 350	–10 to 400	–50 to 450	–50 to 300	–50 to 300	–10 to 400	–50 to 450
	Long	–			–196 to 450	–	–196 to 300	–	–196 to 450
Body with Bellows seal	Short	–10 to 300	–10 to 350	–10 to 400	–50 to 450	–50 to 300	–50 to 300	–10 to 400	–50 to 450
	Long	–			–196 to 450	–	–196 to 300	–	–196 to 450
Valve plug Standard	Metal seal	–196 to 450 °C							
	Soft seal	–196 to 220 °C							
Valve plug Balanced	With PTFE ring	–50 to 220 °C · Lower temperatures on request							
	With graphite ring	220 to 450 °C							
Leakage class according to IEC 60534-4									
Valve plug Metal seal		Standard: IV · High-performance: V							
Valve plug Soft seal		VI							
Valve plug Balanced	Metal seal	Standard: IV · With PTFE or graphite pressure-balancing ring Special version: V · For high-performance (only with PTFE balancing ring) on request							

Table 2: *Materials*

Standard version									
Valve body [1]		Cast iron EN-JL1040	Spheroidal graphite iron EN-JS1049	Cast steel 1.0619	Cast stainless steel 1.4408	Cast steel 1.6220/ 1.1138	Cast stainless steel 1.4308	Forged steel 1.0460	Forged stainless steel 1.4571
Valve bonnet		1.0460/ EN-JL1040	1.0460/1.0619		1.4408/ 1.4401	1.0566 1.6220	1.4308 1.4301	1.0460	1.4401
Seat [2]		1.4006/1.4008			1.4404/ 1.4409	1.4006/ 1.4008	1.4301/ 1.4308	1.4006/ 1.4008	1.4404/ 1.4409
Plug [2]		1.4006 (1.4404)/1.4008			1.4404/ 1.4409	1.4006 (1.4404)/ 1.4008	1.4301/ 1.4308	1.4006 (1.4404)/ 1.4008	1.4404/ 1.4409
Plug seal		Seal ring for soft-seated plug: PTFE with glass fiber							
		Seal ring for balanced plug: PTFE with carbon or graphite ring						–	
Guide bushing		1.4104			1.4571	1.4571	1.4301	1.4104	1.4571
Packing [3]		V-ring packing: PTFE with carbon · Spring: 1.4310							
Body gasket		Graphite on metal core							
Insulating section		1.0460			1.4401	1.0566	1.4301	1.0460	1.4401
Bellows seal	Intermediate piece	1.0460			1.4401	1.0566	1.4301	1.0460	1.4401
	Metal bellows	1.4571 [4]					1.4541	1.4571 [4]	
Heating jacket		–	1.4404						

[1] Special materials for applications with sea water: 1.4538, duplex 1.4470; nickel-based alloy: 9.4610; other special materials on request.

[2] All seats and metal-seated plug also with Stellite facing; for ≤ DN 100 plug up to seat bore 38 made of solid Stellite available.

[3] Other packings on request (see ▶T 8000-1 EN).

[4] Other materials on request.

Table 3: *K_{VS} coefficients*

Table 3a: *Overview (with flow divider St I (K_{VS}I), St II (K_{VS}II) or St III (K_{VS}III))*

K_{VS}	0.1 0.16 0.25	0.4	0.63	1.0	1.6	2.5	4.0	6.3	10	16	25	40	60	80	63	100	160	200	260	250	360	630	1000 *	1500 *
K_{VS}I	–				1.45	2.2	3.6	5.7	9	14.5	22	36	54	72	57	90	144	180	234	225	320	560	900 *	1350 *
K_{VS}II	–								8	13	20	32	48	63	50	80	125	160	210	200	290	500	800	–
K_{VS}III	–								7.5	12	20	30	–	–	47	75	120	–	–	190	270	480	750	–
Seat Ø[mm]	3	6			12			24		31	38	48	63	80	63	80	100	110	130	125	150	200	250	300
Travel [mm]	15														30					60			120	

* Not available with valve body made of cast iron (EN-JL1040).

Terms for control valve sizing according to IEC 60534, Parts 2-1 and 2-2: $F_L = 0.95$, $X_T = 0.75$

Table 3b: *Versions without flow divider · Areas highlighted in gray indicate versions also with pressure balancing*

K_{VS}	0.1 0.16 0.25	0.4	0.63	1.0	1.6	2.5	4.0	6.3	10	16	25	40	60	80	63	100	160	200	260	250	360	630	1000	1500
DN																								
15	•	•	•	•	•	•	•																	
20	•	•	•	•	•	•	•	•																
25	•	•	•	•	•	•	•	•	•															
32		•	•	•	•	•	•	•	•	•														
40		•	•	•	•	•	•	•	•	•	•													
50		•	•	•	•	•	•	•	•	•	•	•												
65											•	•	•				With 19 mm overtravel (not with bellows seal)							
80											•	•	•	•		•								
100															•	•	•							
125															•	•	•	•						
150															•	•	•		•					
200																•	•			•	•	•		
250																•	•			•	•	•	• *	
300																	•			•	•	•	•	•

* DN 250 with K_{VS} = 1000 not available with valve body made of cast iron (EN-JL1040).

Table 3c: *Versions with flow divider St I (K_{VS}I) · Areas highlighted in gray indicate versions also with pressure balancing*

K_{VS}I	–				1.45	2.2	3.6	5.7	9	14.5	22	36	54	72	57	90	144	180	234	225	320	560	900	1350
DN																								
15					•	•	•																	
20					•	•	•																	
25					•	•	•																	
32								•	•	•														
40								•	•	•	•													
50								•	•	•	•	•												
65											•	•	•											
80											•	•	•	•										
100															•	•	•							
125															•	•	•	•						
150															•	•	•		•					
200																				•	•	•		
250																				•	•	•	• *	
300																				•	•	•	•	•

* DN 250 with K_{VS}I = 900 not available with valve body made of cast iron (EN-JL1040).

Table 3a: *Overview (with flow divider St I (K_{VS}I), St II (K_{VS}II) or St III (K_{VS}III))*

K_{VS}	0.1 0.16 0.25	0.4	0.63	1.0	1.6	2.5	4.0	6.3	10	16	25	40	60	80	63	100	160	200	260	250	360	630	1000 *	1500 *
K_{VS}I	–				1.45	2.2	3.6	5.7	9	14.5	22	36	54	72	57	90	144	180	234	225	320	560	900 *	1350 *
K_{VS}II	–								8	13	20	32	48	63	50	80	125	160	210	200	290	500	800	–
K_{VS}III	–								7.5	12	20	30	–	–	47	75	120	–	–	190	270	480	750	–
Seat Ø[mm]	3	6			12			24	31	38	48	63	80		63	80	100	110	130	125	150	200	250	300
Travel [mm]	15														30					60			120	

* Not available with valve body made of cast iron (EN-JL1040).

Terms for control valve sizing according to IEC 60534, Parts 2-1 and 2-2: $F_L = 0.95$, $X_T = 0.75$

Table 3d: *Versions with flow divider St II (K_{VS}II) · Areas highlighted in gray indicate versions also with pressure balancing*

K_{VS}II	–								8	13	20	32	48	–	50	80	125	160	210	200	290	500	800	–
DN																								
15																								
20																								
25																								
32									•	•														
40									•	•	•													
50									•	•	•													
65											•	•	•											
80											•	•	•											
100															•	•	•							
125																•	•							
150															•	•	•		•					
200																•	•			•	•	•		
250																•	•			•	•	•		
300																	•			•	•	•	•	

Table 3e: *Versions with flow divider St III (K_{VS}III) · Areas highlighted in gray indicate versions also with pressure balancing*

K_{VS}III	–								7.5	12	20	30	–	–	47	75	120	–	–	190	270	480	750	–
DN																								
15																								
20																								
25																								
32																								
40																								
50									• *															
65										•	•	•												
80										•	•	•												
100															•									
125																•								
150															•	•	•							
200																•	•			•	•			
250															•	•	•			•	•	•		
300																	•			•	•	•	•	

* Not with bellows seal or insulating section

Table 4: *Dimensions in mm for standard version of Type 3241-1 and Type 3241-7 with flanges or welding ends*

Table 4.1: *Type 3241 Valve, up to DN 150*

Valve	DN	15	20	25	32	40	50	65	80	100	125	150
Length L	mm	130	150	160	180	200	230	290	310	350	400	480
H1 for actuator	≤ 700 cm²	220						260		350	363	390
	1400-60 cm²	–										
	1400-120 cm²											
	2800 cm²											
H2 for	Cast steel	44			72			98		118	144	175
	Forged steel	53	–	70	–	92	98	–	128	–		

Table 4.2: *Type 3241 Valve, DN 200 and higher*

Valve	DN	200	250/cast iron	250 up to 200 mm seat bore	250 seat bore 250 mm and larger	300
Length L	mm	600	730	730	730	850
H4	mm	390	390	451	451	652
H8 [1] for actuator	1000 cm²	418	418	418	503	503
	1400-60 cm²					
	1400-120 cm²	503	503	503	650	650
	2800 cm²					
H2	mm	245	270	310	310	370

[1] H8 increases by 170 mm for valves with K_{VS} 250, 360 or 630 and 60 mm rated travel operating with overtravel.

Table 4.3: *Type 3271 and Type 3277 Pneumatic Actuators*

Actuator	cm²	120	240	350	355	700	750	1000	1400-60	1400-120	2800
Diaphragm ØD	mm	168	240	280	280	390	390	462	530	534	770
H	(700 cm² and larger inc. lifting ring)	70	62	82	121	200	204	357	287	490	630
H3 [1]	Type 3271	110				190		190/610	610	650	
	Type 3277							–			
H5	Type 3277	88	101					–			
Thread	Type 3271	M30x1.5						M60x1.5		M100x2	
	Type 3277							–			
a	Type 3271	G ⅛ (⅛ NPT)	G ¼ (¼ NPT)	G ⅜ (⅜ NPT)				G ¾ (¾ NPT)		G 1 (1 NPT)	
a2	Type 3277	–	G ⅜ (⅜ NPT)					–			

[1] Minimum clearance required to remove the actuator

Table 5: *Weights in kg for standard version of Type 3241-1 and Type 3241-7*

Valve DN	15	20	25	32	40	50	65	80	100	125	150	200	250 cast iron	250 -60/ -120	300
Weight without actuator in kg	6	7.5	8	12	14	18	29	34	52	81	108	430	468	858	920

Actuator cm²		120	240	350	355	700	750	1000	1400-60	1400-120	2800
Type 3271 Actuator	Without handwheel	2.5	5	8	15	22	36	80	70	175	450
	Handwheel ≤ 80 mm travel	–	9	13	20	27	41	180	175	300	575
	Handwheel ≤ 160 mm travel	–								425	700
Type 3277 Actuator	Without handwheel	3.2	9	12	19	26	40	–			
	Handwheel	–	13	17	24	31	45				

Table 6: *Dimensions and weights for Type 3241 with insulating section or bellows seal · Without actuator*

Table 6a: *Type 3241 Valve, up to DN 150 · Without actuator*

Nominal size DN		15	20	25	32	40	50	65	80	100	125	150
Height H4	Short insulating section or bellows seal	408			408			450		635	644	671
	Long insulating section or bellows seal	710			712			754		883	885	912
Weight (kg)	Short/with bellows	9	10.5	11	18	20	24	37	42	70	106	138
	Long/with bellows	13	14.5	15	22	24	28	41	46	78	114	146

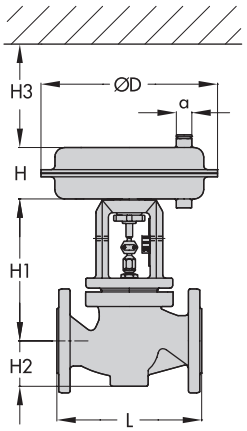
Table 6b: *Type 3241 Valve, DN 200 and larger · Without actuator*

Version with		Insulating section					Metal bellows				
Valve DN (travel) mm		200	250 (cast iron)	250 up to 200 mm seat bore	250 250 mm seat bore	300	200	250 (cast iron)	250 up to 200 mm seat bore	250 250 mm seat bore	300
Height H4 mm		830	830	1065	1065	1150	1036	1036	1492	1492	1520
H8 for actuator	1000 cm²	418	418	418	503	503	418	418	418	503	503
	1400-60 cm²										
	1400-120 cm²	503	503	503	650	650	503	503	503	650	650
	2800 cm²										
Weight approx. kg		478	928			963	520	975			1010

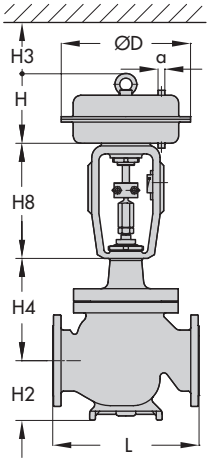
Table 7: *Dimensions in mm for Type 3241 with heating jacket - Not for valves with body materials EN-JL1040 or EN-JS1049*

Nominal size DN		25	40/50	80	100	150	200 to 300
a	mm	110	140	180	200	265	On request
b	mm	15	20	35	50	80	
c	mm	140	170	215	255	130	
d	mm	190	190	230	320	355	

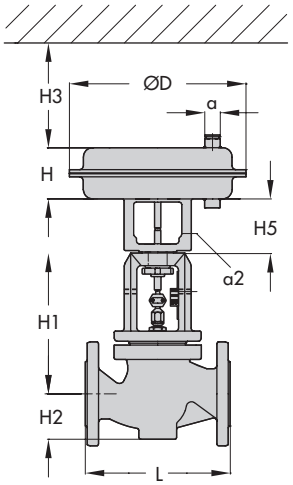
Dimensional drawings



Type 3241-1 · DN 15 to 150

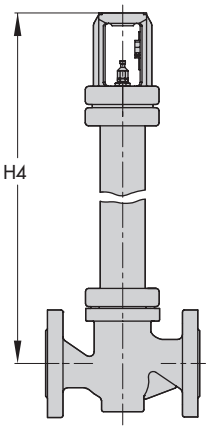


Type 3241-1 · DN 200 to 300

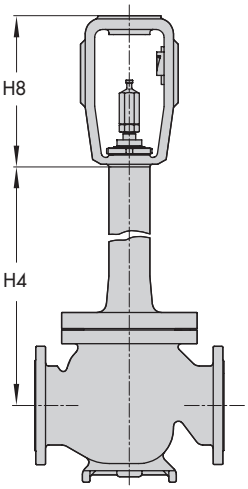


Type 3241-7 · DN 15 to 150

Type 3241 with insulating section or bellows seal



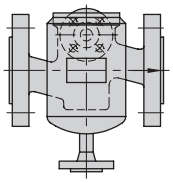
DN 15 to 150

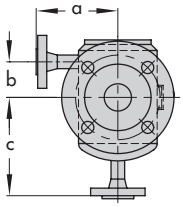


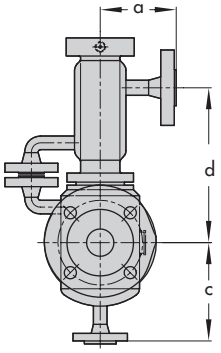
DN 200 to 300

Type 3241 with heating jacket

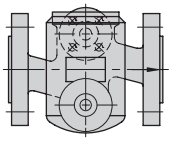
DN 25 to 100

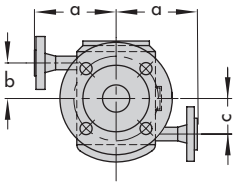




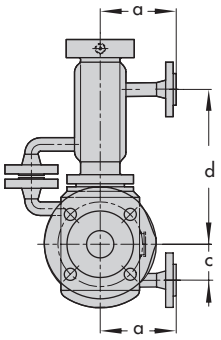


DN 150 to 300





Flanges, DIN 2635



Bellows seal version with heating jacket

Ordering text

Globe valve	Type 3241, DN …, PN …
Body material	According to Table 2
Type of end connection	Flanges or welding ends
Seat and plug	Metal seal/soft seal/ high-performance metal seal
Characteristic	Equal percentage or linear
Pneumatic actuator	Type 3271 or Type 3277
Fail-safe position	Fail-close or fail-open

Process medium	Density and temperature
Max. flow rate	in kg/h oder m^3/h
Pressure	p_1 and p_2 in bar (absolute pressure)
Accessories	Positioner/limit switch

Specifications subject to change without notice

SAMSON AG · MESS- UND REGELTECHNIK
Weismüllerstraße 3 · 60314 Frankfurt am Main · Germany
Phone: +49 69 4009-0 · Fax: +49 69 4009-1507
Internet: http://www.samson.de