



SGM PTM&N

**Program Book/Guidelines for
Festo Products**

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Document Management Information

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1.0 INTRODUCTION

1.1 SCOPE OF DOCUMENT

This document is intended to provide Festo components approved for use on SGM Powertrain programs.

Festo Corporation is an approved SGM Powertrain source for all pneumatic products including cylinders, actuators, valves, filters, regulators, cylinder mounted proximity sensors, Fieldbus Valve/Sensor Manifolds with serial interface, as well as other miscellaneous electro-pneumatic components.

All miscellaneous pneumatic components should be selected according to application needs, under the guidance of the local Festo applications engineer and with the approval of SGMPT.

If, **for technical reasons**, components deviating from this list are required, these have to be chosen preferably from Festo program and a Deviation Request has to be issued. This Deviation Request (data set) has to be approved **in advance** by Festo and then, for the final approval, to be submitted by e-mail to responsible SGMPT Fluid Power Control Engineers.

1.2 COMPANY OVERVIEW

Presenting the Festo Group

Festo is a leading world-wide supplier of automation technology. As a globally-oriented and independent family company, it has become the performance leader in its industry over the last 40 years, thanks to its innovations and problem-solving competence in all aspects of pneumatics as well as its unique range of industrial training and education programs. The Festo Group achieved sales revenues of around € 1.5 billion in its fiscal year 2006 and with 12,000 employees is represented world-wide in roughly 250 locations. Approximately 70 % of total sales are generated outside Germany.

Motion with air – Festo's core competence

Festo's trademarks are its innovations to maximize customer productivity, its global presence and its close customer partnerships. Its success is based on the simplest drive principle in the world: air. Pneumatics – using compressed air or vacuum – has become a key technology in automation and is Festo's core competence.

The company offers some 20,000 automation products, which can be tailored to specific customer needs in a variety of modular programs. Festo's basic product range comprises drives, valves, valve terminals, installation-saving connector systems, handling and assembly technology, air preparation equipment, fittings, vacuum technology, position and quality monitoring, sensors and control technology, as well as a comprehensive range of educational and training products.

Innovative variety for the world of automation

Festo offers ready-to-install subsystems and tailor-made industry-specific solutions, for example for the automobile industries, as well as specialized solutions for regional markets and individual customers. Festo has a dedicated group – known as Customer Solutions – specifically organized to provide specialized solutions to all Festo customers.

Festo products deliberately cover a broad spectrum, ranging from individual components through to sub-assemblies and right up to complete systems. Pre-defined standard products and customized solutions offer the ideal mix with the best price/performance ratio.

With a complete range of services, Festo supports its customers throughout the entire value-creation chain – providing everything from detailed advice, help with the selection of the optimum products and systems and fast installation using the "Plug & Work" principle through to training and on-site servicing.

52 national Festo companies around the world with 250 regional offices in 176 countries ensure that Festo's advice, service, product delivery and reliability precisely meet customer needs in all global economic regions. Today, more than 300,000 industrial customers world-wide rely on Festo's problem-solving competence.

The market for automation technology

The global pneumatics market has been growing moderately for some years now while customer requirements have become increasingly complex. Between 1996 and 2001, global sales grew at an annual average of 5 % to almost € 7 billion. In 2002, Festo steadily developed its share of this market to 17 % and is thus among the market leaders.

New products offer competitive advantage and stimulate demand

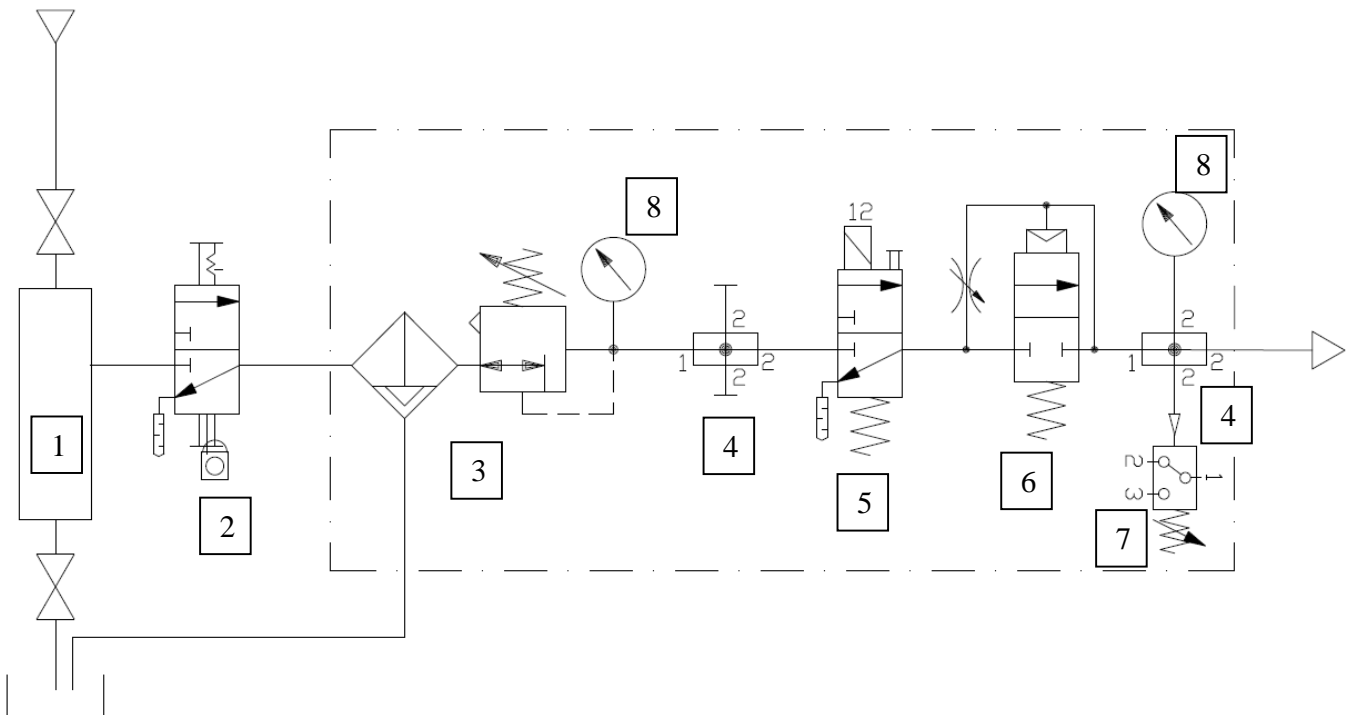
With its innovative solutions in the field of automation technology, the company was able to escape the general trend toward weaker demand and achieve a significant upturn in activities during the first half of 2003. A key factor for this success was the company's unswerving dedication to satisfying customer needs with new products and services. Around 100 new products launched every year and some 2,800 patents world-wide are a clear indication of the company's innovative strength. Festo invests 6.5 % of its annual sales in basic research and development of new products and processes.

2.0 PRODUCT OVERVIEW

Air preparation module Diagram

2.1 AIR PREPARATION

Main Air Preparation Unit



1. Drip Leg
2. Manual Lockout Valve
3. Filter Regulator 5 μm
4. Branching Module
5. Electrical On-Off Valve and Pressure Relief Valve
6. Soft Start Valve
7. Pressure Switch IFM PN5004
8. Pressure Gauge Red / Green

2.1.1 Drip Leg

PART NUMBER	TYPE CODE	DESCRIPTION
534059	DNC-100-3/8-SA-203603	Filter to remove large pollutants, G3/8 ISO port
534427	DNC-100-1/2-SA-203603	Filter to remove large pollutants, G1/2 ISO port
534428	DNC-100-3/4-SA-203603	Filter to remove large pollutants, G3/4 ISO port
534429	DNC-100-1-SA-203603	Filter to remove large pollutants, G1 ISO port



2.1.2 Manual Lock-Out Valve

PART NUMBER	TYPE CODE	DESCRIPTION
197133	HE-G3/8-LO	Manual operated Lock-Out valve, G3/8 ISO port
197134	HE-G1/2-LO	Manual operated Lock-Out valve, G1/2 ISO port
197135	HE-G3/4-LO	Manual operated Lock-Out valve, G3/4 ISO port
197136	HE-G1-LO	Manual operated Lock-Out valve, G1 ISO port



2.1.3 Filter-Regulator **without Pressure Gauge - order Pressure Gauge separately, see 2.2.1**

PART NUMBER	TYPE CODE	DESCRIPTION
192621	LFR-1/4-D-5M-O-MINI-A	Filter-Regulator, G1/4 ISO Ports, 5 Micron, Relieving, Auto Drain
192623	LFR-1/4-D-5M-O-MIDI-A	Filter-Regulator, G1/4 ISO Ports, 5 Micron, Relieving, Auto Drain
192622	LFR-3/8-D-5M-O-MINI-A	Filter-Regulator, G3/8 ISO Ports, 5 Micron, Relieving, Auto Drain
192624	LFR-3/8-D-5M-O-MIDI-A	Filter-Regulator, G3/8 ISO Ports, 5 Micron, Relieving, Auto Drain
192625	LFR-1/2-D-5M-O-MIDI-A	Filter-Regulator, G1/2 ISO Ports, 5 Micron, Relieving, Auto Drain
192626	LFR-3/4-D-5M-O-MIDI-A	Filter-Regulator, G3/4 ISO Ports, 5 Micron, Relieving, Auto Drain
192628	LFR-3/4-D-5M-O-MAXI-A	Filter-Regulator, G3/4 ISO Ports, 5 Micron, Relieving, Auto Drain
192629	LFR-1-D-5M-O-MAXI-A	Filter-Regulator, G1 ISO Ports, 5 Micron, Relieving, Auto Drain
Replacement Elements:		
159640	LFP-D-MINI-5M	Replacement element, 5 Micron, for LFR-xx-D-5M-MINI-A
159594	LFP-D-MIDI-5M	Replacement element, 5 Micron, for LFR-xx-D-5M-MIDI-A
159641	LFP-D-MAXI-5M	Replacement element, 5 Micron, for LFR-xx-D-5M-MAXI-A



Mounting Components:		
159638	HFOE-D-MINI	Mounting Bracket for MINI D-Series pressure regulators
159593	HFOE-D-MIDI/MAXI	Mounting Bracket for MIDI & MAXI D-Series pressure regulators
159642	FRB-D-MINI	Threaded Bolt Set for MINI D-Series air preparation equipment
159595	FRB-D-MIDI	Threaded Bolt Set for MIDI D-Series air preparation equipment
159643	FRB-D-MAXI	Threaded Bolt Set for MAXI D-Series air preparation equipment

2.1.4 Filter

5 Micron:

PART NUMBER	TYPE CODE	DESCRIPTION
162619	LF-1/4-D-5M-MINI-A	Particulate filter, 5 Micron, G 1/4 ISO ports, Auto Drain
186462	LF-1/4-D-5M-MIDI-A	Particulate filter, 5 Micron, G 1/4 ISO ports, Auto Drain
162620	LF-3/8-D-5M-MINI-A	Particulate filter, 5 Micron, G 3/8 ISO ports, Auto Drain
162621	LF-3/8-D-5M-MIDI-A	Particulate filter, 5 Micron, G 3/8 ISO ports, Auto Drain
162622	LF-1/2-D-5M-MIDI-A	Particulate filter, 5 Micron, G 1/2 ISO ports, Auto Drain
162623	LF-3/4-D-5M-MIDI-A	Particulate filter, 5 Micron, G 3/4 ISO ports, Auto Drain
162624	LF-3/4-D-5M-MAXI-A	Particulate filter, 5 Micron, G 3/4 ISO ports, Auto Drain
162625	LF-1-D-5M-MAXI-A	Particulate filter, 5 Micron, G1 ISO ports, Auto Drain
192560	LF-D-5M-MINI-A	Particulate filter, 5 Micron, Auto Drain, Without Flanges
192561	LF-D-5M-MIDI-A	Particulate filter, 5 Micron, Auto Drain, Without Flanges
192562	LF-D-5M-MAXI-A	Particulate filter, 5 Micron, Auto Drain, Without Flanges
Replacement Elements:		
159640	LFP-D-MINI-5M	Replacement element, 5 Micron, for LF-xx-D-5M-MINI-A
159594	LFP-D-MIDI-5M	Replacement element, 5 Micron, for LF-xx-D-5M-MIDI-A
159641	LFP-D-MAXI-5M	Replacement element, 5 Micron, for LF-xx-D-5M-MAXI-A



1 Micron:

PART NUMBER	TYPE CODE	DESCRIPTION
162635	LFMB-1/4-D-MINI-A	Coalescing filter, 1 Micron, G 1/4 ISO ports, Auto Drain
186468	LFMB-1/4-D-MIDI-A	Coalescing filter, 1 Micron, G 1/4 ISO ports, Auto Drain
162636	LFMB-3/8-D-MINI-A	Coalescing filter, 1 Micron, G 3/8 ISO ports, Auto Drain
162637	LFMB-3/8-D-MIDI-A	Coalescing filter, 1 Micron, G 3/8 ISO ports, Auto Drain
162638	LFMB-1/2-D-MIDI-A	Coalescing filter, 1 Micron, G 1/2 ISO ports, Auto Drain
162639	LFMB-3/4-D-MIDI-A	Coalescing filter, 1 Micron, G 3/4 ISO ports, Auto Drain
162640	LFMB-3/4-D-MAXI-A	Coalescing filter, 1 Micron, G 3/4 ISO ports, Auto Drain
162641	LFMB-1-D-MAXI-A	Coalescing filter, 1 Micron, G 1 ISO ports, Auto Drain
192572	LFMB-D-MINI-A	Coalescing filter, 1 Micron, Auto Drain, Without Flanges
192573	LFMB-D-MIDI-A	Coalescing filter, 1 Micron, Auto Drain, Without Flanges
192574	LFMB-D-MAXI-A	Coalescing filter, 1 Micron, Auto Drain, Without Flanges
Replacement Elements:		
162677	MS4/D-MINI-LFMB	Replacement element, 1 Micron, for LFMB-xx-D-MINI-A
162678	LFMBP-D-MIDI	Replacement element, 1 Micron, for LFMB-xx-D-MIDI-A
162679	LFMBP-D-MAXI	Replacement element, 1 Micron, for LFMB-xx-D-MAXI-A



0.01 Micron:

PART NUMBER	TYPE CODE	DESCRIPTION
162651	LFMA-1/4-D-MINI-A	Coalescing filter, .01 Micron, G 1/4 ISO ports, Auto Drain
186470	LFMA-1/4-D-MIDI-A	Coalescing filter, .01 Micron, G 1/4 ISO ports, Auto Drain
162652	LFMA-3/8-D-MINI-A	Coalescing filter, .01 Micron, G 3/8 ISO ports, Auto Drain
162653	LFMA-3/8-D-MIDI-A	Coalescing filter, .01 Micron, G 3/8 ISO ports, Auto Drain
162654	LFMA-1/2-D-MIDI-A	Coalescing filter, .01 Micron, G 1/2 ISO ports, Auto Drain
162655	LFMA-3/4-D-MIDI-A	Coalescing filter, .01 Micron, G 3/4 ISO ports, Auto Drain
162656	LFMA-3/4-D-MAXI-A	Coalescing filter, .01 Micron, G 3/4 ISO ports, Auto Drain
162657	LFMA-1-D-MAXI-A	Coalescing filter, .01 Micron, G 1 ISO ports, Auto Drain
192566	LFMA-D-MINI-A	Coalescing filter, .01 Micron, Auto Drain, Without Flanges
192567	LFMA-D-MIDI-A	Coalescing filter, .01 Micron, Auto Drain, Without Flanges
192568	LFMA-D-MAXI-A	Coalescing filter, .01 Micron, Auto Drain, Without Flanges
Replacement Elements:		
162674	MS4/D-MINI-LFMA	Replacement element, .01 Micron, for LFMA-xx-D-MINI-A
162675	LFMAP-D-MIDI	Replacement element, .01 Micron, for LFMA-xx-D-MIDI-A
162676	LFMAP-D-MAXI	Replacement element, .01 Micron, for LFMA-xx-D-MAXI-A



Note: Coalescing filters use the same mounting components as standard particulate filters.

2.1.5 Regulators **without Pressure Gauge - order Pressure Gauge separately, see 2.2.1**

PART NUMBER	TYPE CODE	DESCRIPTION
192307	LR-1/4-D-7-O-I-MINI	Pressure Regulator, G1/4 ISO ports, Relieving
192319	LR-1/4-D-7-O-I-MIDI	Pressure Regulator, G1/4 ISO ports, Relieving
192309	LR-3/8-D-7-O-I-MINI	Pressure Regulator, G3/8 ISO ports, Relieving
192321	LR-3/8-D-7-O-I-MIDI	Pressure Regulator, G3/8 ISO ports, Relieving
192323	LR-1/2-D-7-O-I-MIDI	Pressure Regulator, G1/2 ISO ports, Relieving
192325	LR-3/4-D-7-O-I-MIDI	Pressure Regulator, G3/4 ISO ports, Relieving
192363	LR-3/4-D-7-O-I-MAXI	Pressure Regulator, G3/4 ISO ports, Relieving
192367	LR-1-D-7-O-I-MAXI	Pressure Regulator, G1 ISO ports, Relieving



Mounting Components:

159638	HFOE-D-MINI	Mounting Bracket for MINI D-Series pressure regulators
159593	HFOE-D-MIDI/MAXI	Mounting Bracket for MIDI & MAXI D-Series pressure regulators
159642	FRB-D-MINI	Threaded Bolt Set for MINI D-Series air preparation equipment
159595	FRB-D-MIDI	Threaded Bolt Set for MIDI D-Series air preparation equipment
159643	FRB-D-MAXI	Threaded Bolt Set for MAXI D-Series air preparation equipment

Precision Regulators:

159500	LRP-1/4-0,7	Precision Pressure Regulator, G1/4 ISO ports, control range up to 0,7 bar
162834	LRP-1/4-2,5	Precision Pressure Regulator, G1/4 ISO ports, control range up to 2,5 bar
159501	LRP-1/4-4	Precision Pressure Regulator, G1/4 ISO ports, control range up to 4 bar
159502	LRP-1/4-10	Precision Pressure Regulator, G1/4 ISO ports, control range up to 10 bar



Mounting Components:

159503	HR-1/4-P	Mounting Bracket for LRP
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2.1.6 Electrical On-Off Valves

PART NUMBER	TYPE CODE	DESCRIPTION
533763	HEE-D-MINI-24-M12	Electrical On/Off Valve, 24VDC, M12 Connection
533767	HEE-D-MIDI-24-M12	Electrical On/Off Valve, 24VDC, M12 Connection
533772	HEE-D-MAXI-24-M12	Electrical On/Off Valve, 24VDC, M12 Connection



2.1.7 Soft Start Valves

PART NUMBER	TYPE CODE	DESCRIPTION
170690	HEL-D-MINI	Soft Start Valve, D-Series, MINI Size



170691	HEL-D-MIDI	Soft Start Valve, D-Series, MIDI Size
170692	HEL-D-MAXI	Soft Start Valve, D-Series, MAXI Size

2.1.8 Distribution Module

PART NUMBER	TYPE CODE	DESCRIPTION
170684	FRM-D-MINI	Branching module, D-Series, MINI Size
170685	FRM-D-MIDI	Branching module, D-Series, MIDI Size
170686	FRM-D-MAXI	Branching module, D-Series, MAXI Size



2.2 ACCESSORIES

2.2.1 Gauges

PART NUMBER	TYPE CODE	DESCRIPTION
546963	MA-40-2,5-1/8-E-RG	Pressure Gauge, 0-2,5 Bar, 1/8" Red/Green Indication
525725	MA-40-10-1/8-E-RG	Pressure Gauge, 0-10 Bar, 1/8" Red/Green Indication
525726	MA-40-16-1/8-E-RG	Pressure Gauge, 0-16 Bar, 1/8" Red/Green Indication
525727	MA-50-2,5-1/4-E-RG	Pressure Gauge, 0-2,5 Bar, 1/4" Red/Green Indication
525728	MA-50-10-1/4-E-RG	Pressure Gauge, 0-10 Bar, 1/4" Red/Green Indication
525729	MA-50-16-1/4-E-RG	Pressure Gauge, 0-16 Bar, 1/4" Red/Green Indication
543488	PAGN-26-10-P10	Pressure Gauge, 0-10 Bar, Cartridge connection (For use with VTSA ISO 15407-2 Sandwich Regulators)



2.2.2 Silencers

PART NUMBER	TYPE CODE	DESCRIPTION
6841	U-1/8-B	Silencer 1/8" BSPT
6842	U-1/4-B	Silencer 1/4" BSPT
6843	U-3/8-B	Silencer 3/8" BSPT
6844	U-1/2-B	Silencer 1/2" BSPT
6845	U-3/4-B	Silencer 3/4" BSPT
151990	U-1-B	Silencer 1" BSPT



2.2.3 Pressure Booster **Application shall be approved by SGMPT fluid power control engineer.**

PART NUMBER	TYPE CODE	DESCRIPTION
184518	DPA-63-10	Pressure Booster Dia. 63mm, 10 bar
184519	DPA-100-10	Pressure Booster Dia. 100mm, 10 bar
193392	DPA-63-16	Pressure Booster Dia. 63mm, 16 bar
188399	DPA-100-16	Pressure Booster Dia 100mm, 16 bar



2.2.4 Air Reservoir **Application shall be approved by SGMPT fluid power control engineer.**

PART NUMBER	TYPE CODE	DESCRIPTION
160233	CRVZS-0.1	0.1 Liter Volume
160234	CRVZS-0.4	0.4 Liter Volume
160235	CRVZS-0.75	0.75 Liter Volume
160236	CRVZS-2	2 Liter Volume
192159	CRVZS-5	5 Liter Volume
160237	CRVZS-10	10 Liter Volume
534845	CRVZS-20	20 Liter Volume



2.2.5 Tubing – Polyurethane

TUBING SERIES	DESCRIPTION	COLORS
PUN	Polyurethane - 4, 6, 8, 10, 12mm OD	Blue, Red (for trapped air)



Polyurethane tubing shall be blue and shall be used only from directional control valve to the pneumatic actuator or pneumatic motor. Red polyurethane tubing shall be used for any applications where any trapped air hazards exists

NOTE: Maximum length of polyurethane tubing is 3-meters or 3-meters plus movable member.

2.2.6 Fittings

SERIES	DESCRIPTION	MATERIAL TYPE
QS-F	Corrosion Resistant Push-Pull Fitting	Chrome/Nickel Plated Brass



2.2.7 Right Angle Flow Controls (Meter-out)

PART NUMBER	TYPE CODE	DESCRIPTION
151165	GRLA-1/8-B	Right-angle, G1/8 ISO Female Thread , 1/8" BSPT Male Thread
151172	GRLA-1/4-B	Right-angle, G1/4 ISO Female Thread , 1/4" BSPT Male Thread
151178	GRLA-3/8-B	Right-angle, G3/8 ISO Female Thread , 3/8" BSPT Male Thread
151179	GRLA-1/2-B	Right-angle, G1/2 ISO Female Thread , 1/2" BSPT Male Thread



2.2.8 Inline Flow Controls (Meter-out)

PART NUMBER	TYPE CODE	DESCRIPTION
151215	GR-1/8-B	One-way flow control, G1/8 Female Thread
2101	GR-1/4	One-way flow control, G1/4 Female Thread
6308	GR-3/8-B	One-way flow control, G3/8 Female Thread
3720	GR-1/2	One-way flow control, G1/2 Female Thread
2103	GR-3/4	One-way flow control, G3/4 Female Thread



2.2.9 PO Check Valves

PART NUMBER	TYPE CODE	DESCRIPTION
530033	HGL-1/2-B	Non-return valve, controlled
530031	HGL-1/4-B	Non-return valve, controlled
530030	HGL-1/8-B	Non-return valve, controlled
530032	HGL-3/8-B	Non-return valve, controlled
530029	HGL-M5-B	Non-return valve, controlled
184588	HAB-1/2	Manual override for HGL
184586	HAB-1/4	Manual override for HGL
184585	HAB-1/8	Manual override for HGL
184587	HAB-3/8	Manual override for HGL



2.2.10 Ball Valves

PART NUMBER	TYPE CODE	DESCRIPTION
9541	QH-1/4	Ball Valve 1/4
9542	QH-3/8	Ball Valve 3/8
9543	QH-1/2	Ball Valve 1/2
9544	QH-3/4	Ball Valve 3/4
9545	QH-1	Ball Valve 1
6837	QH-11/2	Ball Valve 1 1/2



2.2.11 Function Valves

Note: Only for Assembly Lines Application.

PART NUMBER	TYPE CODE	DESCRIPTION
525669	GRXA-HG-1/4-QS-6	One-way flow control valve with stopper function
525670	GRXA-HG-1/4-QS-8	One-way flow control valve with stopper function
525667	GRXA-HG-1/8-QS-4	One-way flow control valve with stopper function
525668	GRXA-HG-1/8-QS-6	One-way flow control valve with stopper function



2.2.12 Quick Exhaust Valves

PART NUMBER	TYPE CODE	DESCRIPTION
9688	SE-1/2-B	Rapid exhaust valve
9686	SE-1/4-B	Rapid exhaust valve
9685	SE-1/8-B	Rapid exhaust valve
2280	SE-3/4	Rapid exhaust valve
9687	SE-3/8-B	Rapid exhaust valve
6822	SEU-1/2	Rapid exhaust valve with build-in silencer
6753	SEU-1/4	Rapid exhaust valve with build-in silencer
4616	SEU-1/8	Rapid exhaust valve with build-in silencer
6755	SEU-3/8	Rapid exhaust valve with build-in silencer



2.2.13 Part Seated Module (Seat Checker)

SERIES	DESCRIPTION	GENERAL INFORMATION
SOPA	Air Gap Sensing Module	Distance Measurement Range 0.02-0.20mm Up to 4 Modules per Unit Digital LCD Display Micro M12 connection



2.2.14 Pressure Sensors

SERIES	DESCRIPTION	GENERAL INFORMATION
SDE1	Piezoresistive pressure sensor with LCD Display	Vacuum or pressure sensing capabilities, G ISO Female, R ISO Male, or 4mm tubing connection, digital or analog feedback, M12 Micro connection



Note: SDE1 shall obtain prior approval from responsible SGMPT fluid power controls engineer.

2.2.15 Vacuum

SERIES	DESCRIPTION	GENERAL INFORMATION
VADM- /VADMI-...	Vacuum Generator	Preferred Product



2.2.16 Ball Valve Drive Unit

SERIES	DESCRIPTION	GENERAL INFORMATION
VZPR-.....	Ball Valve Actuator	Preferred Product



2.3 ACTUATORS

2.3.1 ISO 15552 Cylinders

SERIES	DESCRIPTION	GENERAL INFORMATION
DNC	ISO15552 Pneumatic Cylinder, Aluminium Extrusion	32 - 125 mm Bore Sizes 10 - 2000 mm Stroke Lengths
DNG	ISO 15552 Pneumatic Cylinder, Tie Rod Design	160 - 320 mm Bore Sizes 10 - 2000 mm Stroke Lengths



2.3.2 ISO 6432 Cylinders

SERIES	DESCRIPTION	GENERAL INFORMATION
ESNU	ISO 6432 Single-Acting Pneumatic Cylinder	8-63mm Bore Sizes 1-50mm Stroke Lengths
DSNU	ISO 6432 Double-Acting Pneumatic Cylinder	8-63mm Bore Sizes 1-500mm Stroke Lengths



2.3.3 Locking Cylinder

SERIES	DESCRIPTION	GENERAL INFORMATION
DNC-...-KP	ISO 15552 Pneumatic Cylinder	32-125mm Bore Sizes 10-2000mm Stroke Lengths (Static Locking Only)
DNCKE-S	ISO 15552 Pneumatic Cylinder	40, 63, 100mm Bore Sizes 10-2000mm Stroke Lengths (Dynamic Locking Possible) Note: Using the '-S' Version is absolutely required



2.3.4 Rodless Cylinders

SERIES	DESCRIPTION	GENERAL INFORMATION
DGP DGPL (High Load)	Rodless Cylinder - Mechanically Coupled	18-80mm Bore Sizes 10-3000mm Stroke Lengths
DGC	Rodless Cylinder -With Integrated Guide	8-40mm Bore Sizes 1-2000mm Stroke Lengths
DGO: Cylinder Only SLM: Integrated Slide	Rodless Cylinder - Magnetically Coupled	DGO: 12-40mm Bore, 10-4000mm Stroke SLM: 12-40mm Bore, 10-1500mm Stroke



2.3.5 Compact/Short Stroke Cylinders

SERIES	DESCRIPTION	GENERAL INFORMATION
AEN ADN	ISO 21287 Compact Cylinder AEN = Single Acting ADN = Double Acting	12-125mm Bore Sizes 1-500mm Stroke Lengths



2.3.6 Rotary Actuators

SERIES	DESCRIPTION	GENERAL INFORMATION
DSM	Rotary Vane Actuator	6-40mm Bore Sizes
DRQD	Rotary Rack & Pinion Actuator	16-32mm Bore Sizes



2.3.7 Guided Cylinder

SERIES	DESCRIPTION	GENERAL INFORMATION
DFM	Flat Body Guided Cylinder	12-100mm Bore Sizes 10-200mm Stroke Lengths



2.3.8 Stopper Cylinder **Pass on technical data to responsible SGMPT fluid power control engineer**

SERIES	DESCRIPTION	GENERAL INFORMATION
DFST	Heavy Duty Stopper Cylinder	50, 63, 80mm Bore Sizes Load capacity up to 800kg Adjustable & Replaceable Shock Absorber



2.3.9 Guiding Units

PART NUMBER	TYPE CODE	DESCRIPTION
35197	FEN-8/10-.....-KF	For ISO Cyl. 6432 Dia. 8/10 max stroke 100m
33481	FEN-12/16-.....-KF	For ISO Cyl. 6432 Dia. 12/16 max stroke 100m
33482	FEN-20-.....-KF	For ISO Cyl. 6432 Dia. 20 max stroke 100m
33483	FEN-25-.....-KF	For ISO Cyl. 6432 Dia. 25 max stroke 100m
	FENG-....._KF	For ISO Cyl. 15552 Dia. 25- 100



2.3.10 Cylinder Sensors

SERIES	DESCRIPTION	GENERAL INFORMATION
SMT-8F	M12x1 plug	Preferred Sensor
SMT-10F	M8x1 plug	Sensor
SMTO-1-PS-...-C	DRQ 40 and larger, DKE	Mounting kit SMB-1, SMB-2-B, SMB-3-B
SIEN-(M5/M8)-PS-S-L	DSR, DSM, DSL	WSR-..., WSM-...



2.4 DIRECTIONAL VALVES

2.4.1 ISO 15407-2

ISO 15407 series Directional control valves shall be given consideration as first choice

Profibus Manifold: 539217 VTSA-FB

NOTE: Verify proper configuration by using Festo Online Configuration tool.

Profibus Electrical Order Code:

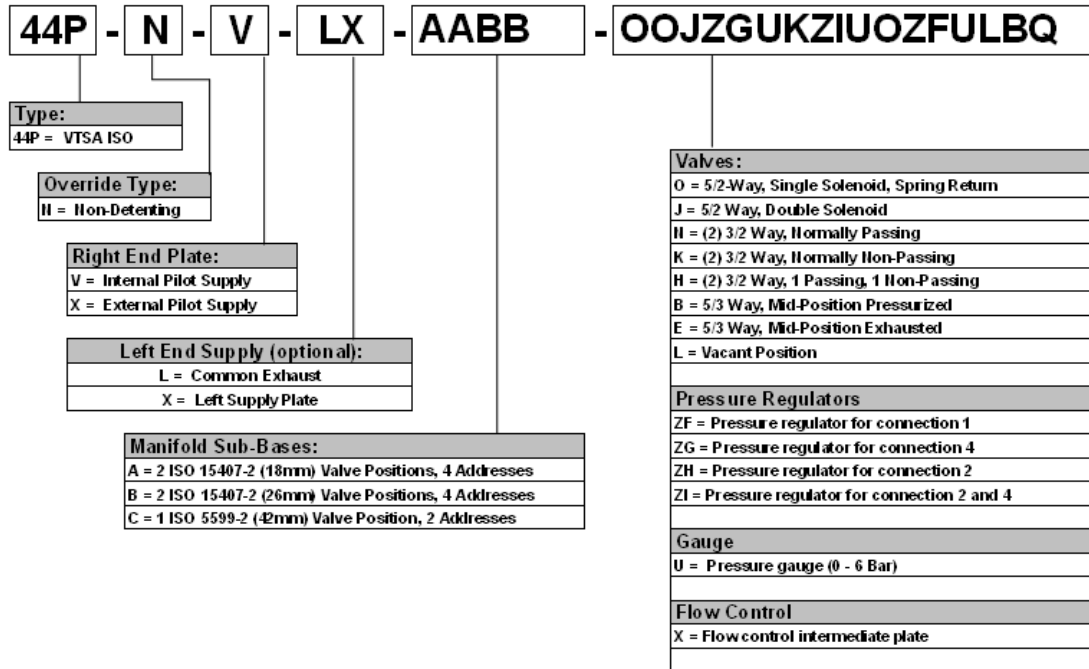
50E - F13GES - S

Type:
 50E = CPX Terminal

Electronic Modules (up to 9 allowed)	
Fieldbus/Input/Output Options	Connection Technology
F13 = Profibus DP Control Node	GC = without node specific connectors
E = 8 Digital Inputs	GE = Plug straight, IP65 Sub-D 9-pin, for Profibus DP
F = 4 Digital Inputs	GF = Adapter, 2xM12 B-encoded, for Profibus DP
L = 8 Digital Outputs	GO = Connecting block 2xM12, B-encoded, 5-pin for Profibus-DP
A = 4 Digital Outputs	X = Manifold block 4xM12 5-pin, double
Electrical Supply	GW = Connecting block 4xM12, 5-pin, double, metal thread
S = Interlinking block with system supply	W = Manifold block 4xM12 5-pin, double, screened
QS = Connecting block with system supply, M18, 4-pin	
QR = Connecting block with system supply, 7/8", 4-pin	
QP = Connecting block with system supply, 7/8", 5-pin	
QZ = Connecting block with additional supply, M18, 4-pin	
QX = Connecting block with additional supply, 7/8", 5-pin	

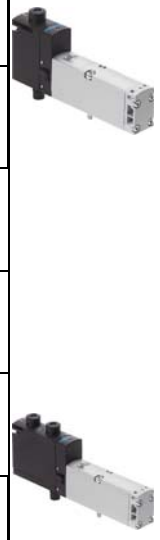


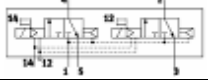
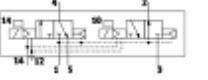
Pneumatic Order Code for Fieldbus protocol (up to 32 solenoids for Profi-bus):



2.4.2 VTSA Directional Control Valves -15407-2 (Sizes 01)

PART NUMBER	TYPE CODE	DESCRIPTION
539159	VSVA-B-M52-MZD-A1-1T1L	ISO Size 01 (26mm) 5/2 Valve Single Solenoid Mechanical Spring Return
539156	VSVA-B-B52-ZD-A1-1T1L	ISO Size 01 (26mm) 5/2 Valve Double Solenoid Pilot
539161	VSVA-B-P53E-ZD-A1-1T1L	ISO Size 01 (26mm) 5/3 Valve Double Solenoid Exhausted Center
539162	VSVA-B-P53C-ZD-A1-1T1L	ISO Size 01 (26mm) <i>Need approval.</i> 5/3 Valve Double Solenoid Closed Center
539160	VSVA-B-P53U-ZD-A1-1T1L	ISO Size 01 (26mm) 5/3 Valve Double Solenoid Pressurized Center
539152	VSVA-B-T32U-AZD-A1-1T1L	ISO Size 01 (26mm) 2x3/2 Valve Normally Open



539150	VSVA-B-T32C-AZD-A1-1T1L	ISO Size 01 (26mm) 2x3/2 Valve Normally Closed	
539154	VSVA-B-T32H-AZD-A1-1T1L	ISO Size 01 (26mm) 2x3/2 Valve 1x Normally Open., 1 x Normally Non-Closed	

2.4.3 VTSA ISO 15407-2 Accessories

PART NUMBER	TYPE CODE	DESCRIPTION
539721	VABF-S4-1-A2G2-G14	ISO Size 01, 90° Connection Plate, G1/4 ISO Thread
540175	VABF-S4-1-F1B1-C	ISO Size 01 Sandwich Flow Control
540154	VABF-S4-1-R1C2-C-10	ISO Size 01 Sandwich Regulator, P (1) Port, 0-10 Bar
540158	VABF-S4-1-R3C2-C-10	ISO Size 01 Sandwich Regulator, A (4) Port, 0-10 Bar
540162	VABF-S4-1-R2C2-C-10	ISO Size 01 Sandwich Regulator, B (2) Port, 0-10 Bar
540166	VABF-S4-1-R4C2-C-10	ISO Size 01 Dual Sandwich Regulator, A/B (2/4) Port, 0-10 Bar
540152	VABF-S4-1-R1C2-C-6	ISO Size 01 Sandwich Regulator, P (1) Port, 0-6 Bar
540156	VABF-S4-1-R3C2-C-6	ISO Size 01 Sandwich Regulator, A (4) Port, 0-6 Bar
540160	VABF-S4-1-R2C2-C-6	ISO Size 01 Sandwich Regulator, B (2) Port, 0-6 Bar
540164	VABF-S4-1-R4C2-C-6	ISO Size 01 Dual Sandwich Regulator, A/B (2/4) Port, 0-6 Bar
546253	VABF-S4-1-R7C2-C-10	ISO Size 01 Sandwich Regulator, A (4) Port, 0-10 Bar
546249	VABF-S4-1-R7C2-C-6	ISO Size 01 Sandwich Regulator, A (4) Port, 0-6 Bar
539212	VABB-S4-1-WT	ISO Size 01 Blanking Plate



2.4.4 VSVA Directional Control Valves -15407-1 (Sizes 01)

PART NUMBER	TYPE CODE	DESCRIPTION
534556	VSVA-B-M52-MH-A1-1R5L	5/2, single solenoid
534546	VSVA-B-M52-MZH-A1-1R5L	5/2, single solenoid, external
534557	VSVA-B-B52-H-A1-1R5L	5/2, double solenoid
534547	VSVA-B-B52-ZH-A1-1R5L	5/2, double solenoid, external
534561	VSVA-B-P53U-H-A1-1R5L	5/3-way, pressurised
534551	VSVA-B-P53U-ZH-A1-1R5L	5/3-way, pressurised, external
534559	VSVA-B-P53C-H-A1-1R5L	5/3-way, closed
534549	VSVA-B-P53C-ZH-A1-1R5L	5/3-way, closed, external
534560	VSVA-B-P53E-H-A1-1R5L	5/3-way, exhausted
534550	VSVA-B-P53E-ZH-A1-1R5L	5/3-way, exhausted, external
534552	VSVA-B-T32C-AH-A1-1R5L	2 x 3/2-way, closed
534542	VSVA-B-T32C-AZH-A1-1R5L	2 x 3/2-way, closed, external
534553	VSVA-B-T32U-AH-A1-1R5L	2 x 3/2-way, open
534543	VSVA-B-T32U-AZH-A1-1R5L	2 x 3/2-way, open, external
534554	VSVA-B-T32H-AH-A1-1R5L	2 x 3/2-way, 1 open, 1 closed
534544	VSVA-B-T32H-AZH-A1-1R5L	2 x 3/2-way, 1 open, 1 closed, external



2.4.5 ISO 15407-1 Individual Sub bases

PART NUMBER	TYPE CODE	DESCRIPTION
161109	NAS-1/4-01-VDMA	Individual sub-base
161102	NAW-1/4-01-VDMA	Manifold sub-base
161104	NEV-01-VDMA	End plate kit
161107	NDV-01-VDMA	Blanking plate
161105	NSC-1/2-01-VDMA	Isolating disc Port 1,2,3
161106	NSC-1/8-01-VDMA	Isolating disc Port 12 and 14



3.0 SERVICE & SUPPORT

Technical support

	NORTH AMERICA	EUROPE	EAST ASIA
Company	Festo Corporation	Festo AG & Co. KG	Festo Korea Co, Ltd.
Address	2601 Cambridge Court Suite 320 Auburn Hills, MI 48326	Ruiter Strasse 82 Esslingen, Germany 73734	470-, Kasan Dong Kumchun-Ku Seoul, Korea
Phone	++1 248-340-1778	++49 (0) 711-347-2030	++82 2-850-7275
Local Support	Mark Kuenzel Bryan Morehouse	Thorsten Weiss	Sung-Mok Cho
Fax	++1 248-340-1790	++49 (0) 711-347-542030	++82 2-864-7040
E-Mail	Mark.Kuenzel@us.festo.com Bryan.Morehouse@us.festo.com	thw@de.festo.com	Kr0smcho@festo.com

4.0 ORDERING /PROJECT /SALES INFORMATION

ORDERING INSTRUCTIONS

All orders must be placed directly through the nearest Authorized Festo Sales Representative.

Project and sales contacts

	NORTH AMERICA	EUROPE	EAST ASIA
Address	Festo Corporation 2601 Cambridge Court Suite 320 Auburn Hills, MI 488326	Festo AG & Co. KG Ruiter Str 82 Esslingen, Germany 73734	Festo K.K. 470-, Kasan Dong Kumchun-Ku Seoul, Korea
Project Contact	Mark Jagels	Peter Pappert	Joong-Hee Kim
Phone	++1 586-419-7501	++49 (0) 711-347-50077	++82 2-850-7360
Fax	++1 248-340-1790	++49 (0) 711-34754-50077	++82 2-864-7040
E-Mail	Mark.Jagels@us.festo.com	PAPE@de.festo.com	jhkim@festo.com