

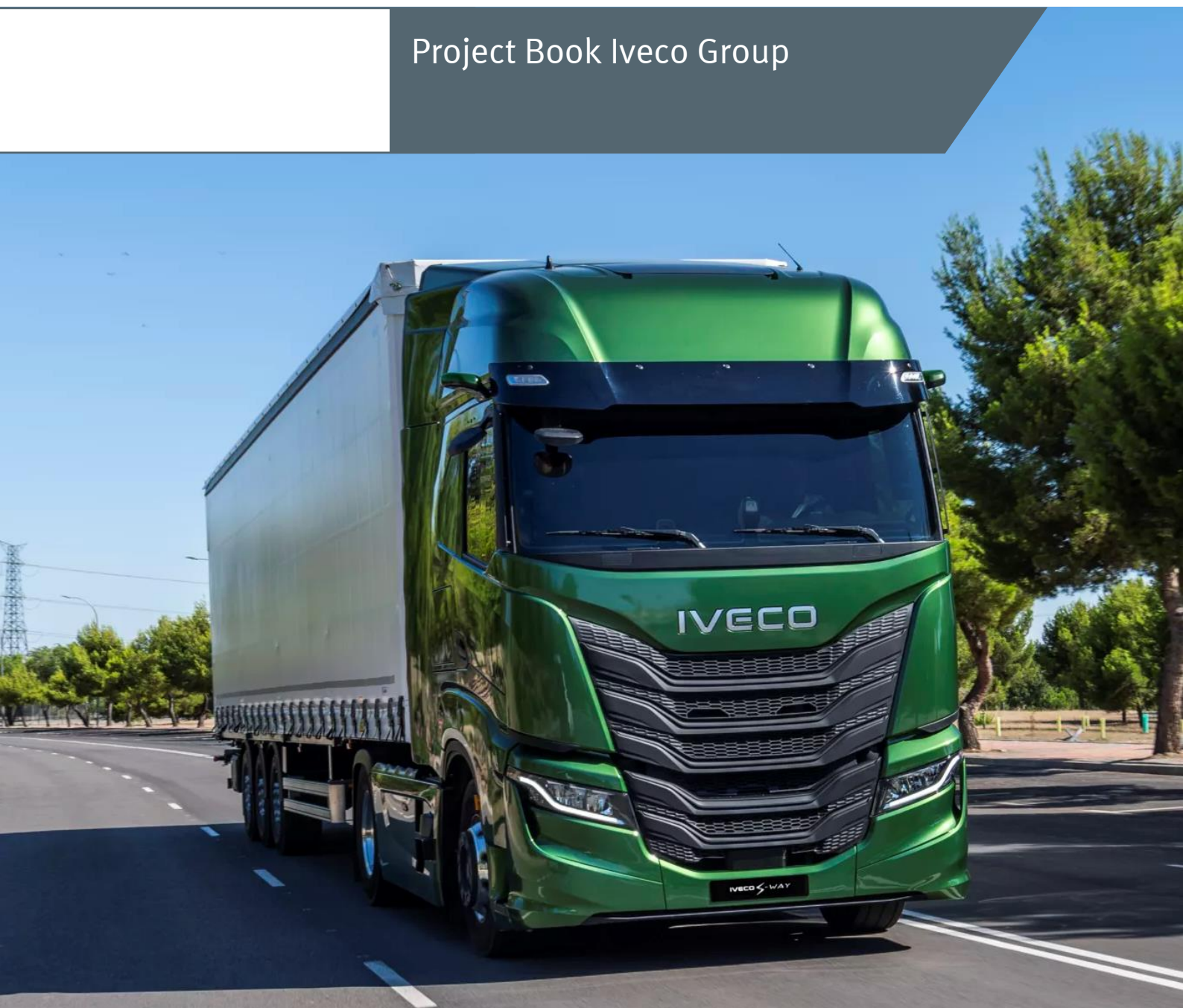
IVECO • GROUP

IVECO



FESTO

Project Book Iveco Group



Version 3.0

Date	08.11.2024
Creator	Davide Gennaro
Version	3.0

All technical data are correct at the time of going to print.

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2 Document Change Information

Version	Date	Name	Type of Changes	Page / Chapter
3.0	08.11.2024	Davide Gennaro	- new version with Saphir Program - new EA products	all 6.2 and 6.3

Legend:

-  = Online-Catalogue
-  = Documentation
-  = CAD
-  = Data Sheet
-  = Accessories
-  = Spare Parts
-  = Support Portal

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4 General Information

This specification defines products and automation concepts which are state of the art and ensure the availability worldwide.

Any deviation from this specification must be approved in writing.

Please note that this specification provides an indication of the product families approved for use.

Specific part numbers etc. can be advised via FESTO project management.

5 Support from FESTO

5.1 Online Shop

Efficient purchasing in the Festo Online Shop

The convenient product selection process guides you to the right product quickly and reliably. Practical filter functions, intuitive operation and the valuable information in the selection aid make selecting products especially easy. Recommended accessories are displayed visually on the product page.

Registered customers can see prices and availability, can conveniently access information from previous orders, import bills of materials, share shopping baskets, and easily download documents such as order confirmations, delivery notes and invoices. Thanks to seamless order and shipment tracking, you can always keep an eye on all the delivery dates, which means maximum planning reliability, even for orders placed outside the Online Shop.

What is especially advantageous is that the Festo Online Shop is fully compatible with all mobile devices so that, for example, your maintenance staff can select and order the required products on site directly from their mobile phone.

You can activate all the features of the Festo Online Shop by simply registering. This gives you access to the complete product portfolio, as well as useful information, tools, and services.



 [Festo Online Shop](#)

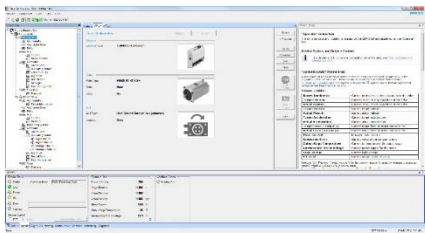


Benefits:

- Customer-specific prices and current product availability:
 - avoid delays with direct access to information.
- Order tracking:
 - check the status of your order at any time – even fax & phone orders.
- Save part lists:
 - access frequently used products quickly and easily.
- Import/export part lists, and copy & paste:
 - avoid typos and speed up your order process.
- Repeat orders:
 - quick and easy: open previous orders as a new basket, make changes, then order
- Completely flexible:
 - manage and convert quotations at a time. Available 24 hours a day 7 days a week.

5.2 Digital Engineering tools

Are you wondering whether digitalization offers opportunities for simplifying your design and sizing process? Of course! With our online engineering tools, you can design your solution easily and reliably, select exactly the right components or run calculations, regardless of your level of expertise. Take a look at our overview now and find the right tool to make your day-to-day work easier.



[Engineering tools](#)



Sizing	▼
Calculation	▼
Configuration	▼
Simulation	▼
Design	▼
Catalogue	▼
Commissioning	▼
Service	▼

5.3 Safety in automation technology

You may well have realized that even the best components leave you with uncertainty if it is not clear how to design and operate the machine safely and correctly. This may be, for example, because there are no application notes. Or because important figures are missing from the datasheet. That is why we provide advice and help you to implement your machine safely, with minimal effort and in line with the EC Machinery Directive, regardless of whether you choose pneumatic or electric drive technology.



[Safety in automation technology](#)



5.4 Service and support

You can rest assured that we are available to provide personal or online support whenever you need us. This applies to all phases of value creation, from engineering to operation and beyond. And we listen to you. After all, it is your systems that are at stake. We help you to keep your processes running smoothly and without downtimes. When it matters most, we're there right away to help.



Service and support



Approvvigionamento e consegna

Per l'ordine di prodotti e servizi digitali tutti i nostri canali sono aperti: internet, fax, telefono, Online Shop e App World. Consegne rapide e affidabili in tutto il mondo.

Al servizio per l'acquisto



Installazione e messa in servizio

Supporto in loco all'avvio della macchina, dall'installazione alla messa in servizio. I nostri strumenti sono di ausilio per configurazione e parametrizzazione, analisi e diagnosi degli errori.

Al servizio messa in servizio



Programmazione

Per l'integrazione dei nostri prodotti nel tuo PLC mettiamo a disposizione modelli funzionali e forniamo supporto con una programmazione dell'applicazione specifica del cliente.

Al servizio di programmazione



Eliminare ed evitare i guasti

I servizi di risoluzione dei problemi e manutenzione garantiscono un elevato livello di disponibilità dell'impianto. Da noi, questi includono supporto rapido di emergenza e manutenzione preventiva.

Servizi di manutenzione

Maggiore assistenza e supporto di Festo



Festo Energy Saving Service

La nostra offerta di servizi personalizzati ti mostra lo status quo dei tuoi sistemi e impianti di aria compressa, la valutazione identifica i potenziali risparmi e formula raccomandazioni specifiche.

Vai al risparmio d'energia



Cercare componenti soggetti a usura o di ricambio?

Il catalogo dei ricambi mostra per quali prodotti sono disponibili parti soggette a usura o di ricambio, come ordinate e come riparare facilmente e in autonomia, utilizzando le relative istruzioni.

Vai al catalogo ricambi



Parti di ricambio e riparazioni

Il catalogo digitale contiene tutte le parti di ricambio adeguate. Potrai eseguire la riparazione in autonomia, seguendo le istruzioni. L'alternativa è il nostro servizio di riparazione professionale.

Vai ai servizi di riparazione



Documentazione del prodotto

Sia cercando informazioni e documentazione sui nostri prodotti? Qui ti riportiamo una panoramica delle informazioni e dei download relativi ai prodotti.



Formazione/consulenza, da e per l'industria

Utiliamo competenze digitali e all'esperienza di produzione. Le nostre soluzioni di formazione e consulenza riuniscono il meglio di entrambe, rendendoci un fornitore di training del "DNA Industriale".



Semplici video tutorial per l'autosostegno

Il nostro canale YouTube Festo Service mostra le istruzioni per riparazioni, configurazioni, modifiche e messa in servizio passo dopo passo, pratiche e intuitive.

6 Overview

6.1 Pneumatic drives

6.1.1 Compact cylinders to ISO 21287

Name	Remarks	Picture	Links
Compact cylinder ADN	Diameter: 12, 16, 20, 25, 32, 40, 50, 63, 80, 100, 125 mm Stroke length: 1 ... 500 mm Force: 51 ... 7363 N Double-acting Fixed/self-adjusting cushioning		Online Catalogue Documentation (EN)

6.1.2 Standard cylinder to ISO 15552

Name	Remarks	Picture	Links
Standard cylinder DSBC	Diameter: 32, 40, 50, 63, 80, 100, 125 mm Stroke length: 1 ... 2800 mm Force: 483 ... 7363 N Double-acting Position sensing Fixed/adjustable/self-adjusting cushioning		Online Catalogue Documentation (EN)
Standard cylinder DSBG	Diameter 32, 40, 50, 63, 80, 100, 125, 160, 200, 250, 320 mm Stroke length 1 ... 2800 mm Force: 483 ... 48255 N Double-acting Position sensing Fixed/adjustable/self-adjusting cushioning		Online Catalogue Documentation (EN)

6.1.3 Round cylinders to DIN ISO 6432

Name	Remarks	Picture	Links
Round cylinders DSNU	Diameter: 8, 10, 12, 16, 20, 25 mm (standard) Diameter: 32, 40, 50, 63 mm Stroke length: 1 ... 500 mm Force: 19 ... 1870 N Double-acting Position sensing Fixed/adjustable/self-adjusting cushioning Mounting flange		Online Catalogue Documentation (EN)

6.1.4 Cylinder with clamping unit

Name	Remarks	Picture	Links
Cylinder with holding brake DFLC	Diameter 40, 63, 100 mm Stroke length 10 ... 2000 mm Force: 754 ... 4712 N Double-acting Position sensing Adjustable cushioning		Online Catalogue Documentation (EN)
Cylinder with holding brake DFLG	Diameter 160 mm Stroke length 10 ... 2000 mm Force 12064 N Double-acting Position sensing Adjustable cushioning		Online Catalogue Documentation (EN)
ISO cylinder with clamping cartridge DSBC-C	Diameter 32, 40, 50, 63, 80, 100, 125 mm Stroke length 10 ... 2000 mm Force: 483 ... 7363 N Double-acting Position sensing Fixed/adjustable/self-adjusting cushioning		Online Catalogue Documentation (EN)
Round cylinders with clamping cartridge DSNU-KP	Diameter: 8, 10, 12, 16, 20, 25 mm (standard) Diameter: 32, 40, 50, 63 mm Stroke length: 1 ... 500 mm Force: 19 ... 1870 N Double-acting Position sensing Fixed/adjustable cushioning		Online Catalogue Documentation (EN)
Compact cylinder with clamping cartridge ADN-KP	Diameter: 20, 25, 32, 40, 50, 63, 80, 100 mm Stroke length: 10 ... 500 mm Force: 188 ... 4712 N Double-acting Position sensing Fixed cushioning		Online Catalogue Documentation (EN)

6.1.5 Mechanical coupling

Name	Remarks	Picture	Links
Linear drives DGC	Diameter: 8, 12, 18, 25, 32, 40, 50, 63 mm Stroke length: 1 ... 8500 mm Force: 30 ... 1870 N Position sensing Various cushioning options		Online Catalogue Documentation (EN)
Linear drives DGC-HD	Diameter: 18, 25, 40 mm Stroke length: 1 ... 5000 mm Force: 153 ... 754 N Position sensing End position cushioning with shock absorber Recirculating ball bearing guide		Online Catalogue Documentation (EN)

6.1.6 Semi-rotary drives with rack and pinion

Name	Remarks	Picture	Links
Semi-rotary drives DRRD	Size 8, 10, 12, 16, 20, 25, 32, 35, 40, 50, 63 mm Torque 0.2 ... 112 Nm Swivel angle 0 ... 180° Position sensing Cushioning: elastic (P), hydraulic shock absorbers Flanged shaft		Online Catalogue Documentation (EN)

6.1.7 Drives with guide rods

Name	Remarks	Picture	Links
Guided drives DFM, metric	Diameter 6, 10, 12, 16, 20, 25, 32, 40, 50, 63, 80, 100 mm Stroke length 10 ... 400 mm Force 13 ... 4712 N Position sensing Fixed/adjustable cushioning Plain-bearing guide Recirculating ball bearing guide Variants available.		Online Catalogue Documentation (EN)

6.1.8 Stopper cylinder and feed separator

Name	Remarks	Picture	Links
DFST stopper cylinder	Diameter 32, 50, 63, 80 mm Stroke length 20 ... 40 mm Permissible impact force on the advanced piston rod 1000 ... 6000 N Position sensing Fixed cushioning Toggle lever		Online Catalogue Documentation (EN)

6.2 Electric drives

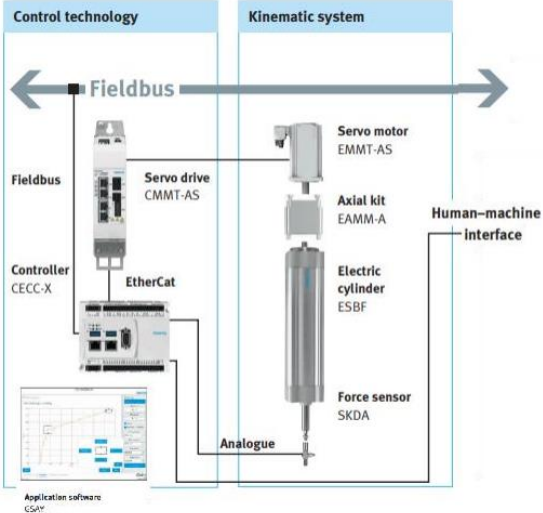


Servopress



Technical data	
Storage temperature [°C]	-10 ... +60
Operating temperature [°C]	0 ... +40
Stroke length [mm]	100, 200, 300, 400
Force ranges [kN]	0.1 – 0.8, 1.5, 4, 7, 12, 17 ¹⁾
Max. feed speed [mm/s]	250
Repetition accuracy [mm]	± 0.01
Interface	EtherNet, 24 V I/O
Bus systems	Modbus-TCP, EtherNet/IP, EtherNet TCP/IP, Profinet, OPC-UA
Configuration via visualisation system	Force/displacement diagrams Default for good/bad parts Visualisation
FS accuracy of force measurement ²⁾ [%]	± 0.25
Measuring speed for force sensor	1,000 measurements/s
Evaluation methods	Window technique Threshold Envelope
Visualisation	At the customer's premises via a web browser

¹⁾ Other variants and output stages up to 100 kN on request.
²⁾ Related to the pressing force of the complete system.
Example for YJKP-0.8: 0.25% x 800 N



6.2.1 Electric axes

Name	Remarks	Picture	Links
Toothed belt axes EGC-TB	Size 50, 70, 80, 120, 185 Stroke length 50 ... 8500 mm Force 50 ... 2500 N.		Online Catalogue Documentation (EN)
Spindle axes EGC-BS	Size 70, 80, 120, 185 Stroke length 50 ... 3000 mm Force 300 ... 3000 N.		Online Catalogue Documentation (EN)
Toothed belt axes EGC-HD-TB	Size 125, 160, 220 Stroke length 50 ... 5000 mm Force 450 ... 1800 N.		Online Catalogue Documentation (EN)
Spindle axes EGC-HD-BS	Size 125, 160, 220 Stroke length 50 ... 2400 mm Force 300 ... 1300 N.		Online Catalogue Documentation (EN)
Cantilever axis ELCC	Size 60, 70, 90, 110 Stroke length max. 2000 mm Force 300 ... 2500 N Recirculating ball bearing guide		Online Catalogue Documentation (EN)
Single-axis systems YXCS	Strokes: max. 3000 mm Modules: electric Payload: depends on the required dynamics		Online Catalogue Documentation (EN)

6.2.2 Electric cylinders and slides

Name	Remarks	Picture	Links
Electric cylinder ESBF	Size 32, 40, 50, 63, 80, 100 Stroke length 30 ... 1500 mm Force: 600 ... 17000 N Motor can be mounted using axial or parallel kit Linear drive with ball screw in Clean Design		Online Catalogue Documentation (EN)
Mini slides EGSL	Size 35, 45, 55, 75 Stroke length 50 ... 300 mm		Online Catalogue Documentation (EN)

6.3 Motors and controllers

6.3.1 Servo motors

Name	Remarks	Picture	Links
Servo motors EMMT-AS	Size 60, 80, 100 Stall torque 0.66 ... 10.8 Nm Voltage 325 ... 565 V DC Nominal current 1.4 ... 4.7 A		Online Catalogue Documentation (EN)

6.3.2 Stepper motors

Name	Remarks	Picture	Links
EMMS-ST stepper motor	Size 28, 42, 57, 87 Holding torque 0.09 ... 8.6 Nm Voltage 48 V DC Nominal current 1.4 ... 9.5 A Suitable motor cable Suitable motor flange.		Online Catalogue Documentation (EN)

6.3.3 Controller for servo motors

Name	Remarks	Picture	Links
Servo drive CMMT-AS	Nominal voltage 230 ... 400 V AC Nominal current 2 ... 12 A Nominal power: 350 ... 6000 VA		Online Catalogue Documentation (EN)

6.3.4 Controller for stepper motors

Name	Remarks	Picture	Links
Servo drive CMMT-ST	Voltage 24, 48 V DC Nominal current 8 A (peak 10A) Power up to 300W		Online Catalogue Documentation (EN)

6.4 Vacuum technology

6.4.1 Vacuum generators

Name	Remarks	Picture	Links
OVEM vacuum generator, metric	Nominal diameter 0.45 ... 2.0 mm Port -Plug connector QS6, QS8 Solenoid valve vacuum IN/OUT Solenoid valve for ejector pulse Integrated vacuum switch.		Online Catalogue Documentation (EN)
Vacuum generators VN, pneumatic	Nominal size 0.45 to 3 mm Connection -Plug connector QS4, QS6, QS8, QS10, QS12 -Thread M5, G1/8, G1/4, G3/8 -Push-in sleeve 4.6 mm Standard -Vacuum port 90° to supply port Inline -Vacuum port in line with supply port Ejector pulse valve, pneumatic.		Online Catalogue Documentation (EN)
Vacuum generators VN, electro-pneumatic	Nominal size 0.45 to 3 mm Connection -Plug connector QS4, QS6, QS8, QS10, QS12 -Thread M5, G1/8, G1/4, G3/8 Standard -Vacuum port 90° to supply port Inline -Vacuum port in line with supply port Solenoid valve, vacuum ON/OFF Vacuum switch, integrated.		Online Catalogue Documentation (EN)

6.4.2 Vacuum gripping technology

Name	Remarks	Picture	Links
Vacuum suction cup OGVM	Suction cup size diameter 20 ... 125 mm, 16x55 ... 70x145 mm Connection, female thread G 1/4 Round suction cup with connector - Flat - Bell-shaped - Bellows, 1.5 convolutions Oval suction cup with connector - Flat - Bell-shaped - Bellows, 1.5 convolutions		Online Catalogue Documentation (EN)
Suction gripper ESG, round	Suction cup size diameter 2 ... 200 mm Connection - Male thread - Female thread - Push-in connector - Barbed connector Round suction cup - Standard - Extra deep suction cup - Bellows, 1.5-fold - Bellows, 3.5-fold - Bell-shaped Height compensator Angle compensator Filter		Online Catalogue Documentation (EN)
Suction gripper ESG, oval	Suction cup size, diameter 4x10 ... 30x90 mm Connection - Male thread - Female thread - Push-in connector - Barbed connector Oval suction cup Height compensator Angle compensator Filter		Online Catalogue Documentation (EN)

6.5 Valves

6.5.1 Standards based directional control valves

Name	Remarks	Picture	Links
Standard valves VSVA with central plug	Flow rate 400 ... 1400 l/min Voltage 24 V DC Sub-base valve Solenoid actuated, piloted Sub-bases.		Online Catalogue PDF Documentation (EN)
Standard valves to ISO 5599-1	Connection G1/4, ISO1; G3/8, ISO2; G1/2, ISO3; G3/4, ISO4 Flow 1 200 ... 6 000 l/min Voltage Sub-base valve - Electrically actuated, piloted - Pneumatically actuated Sub-bases Manifold sub-bases Throttle plates Intermediate pressure regulator plates.		Online Catalogue PDF Documentation (EN)

6.5.2 Mechanically and manually actuated directional control valves

Name	Remarks	Picture	Links
Valves VHEF, metric	Valve functions 3/2, 5/2, 5/3 Connection G $\frac{1}{8}$, G $\frac{1}{4}$ Actuation types selector switch, finger lever, hand lever, toggle lever, roller lever with idle return, pushbutton Directly actuated Vacuum operation possible		Online Catalogue PDF Documentation (EN)
Valves VMEF, metric	Valve functions 3/2, 5/2 Connection G 1/8, G 1/4 Actuation types plunger, roller lever, one-way roller lever Directly actuated or pneum. actuated Vacuum operation possible in part		Online Catalogue PDF Documentation (EN)
Valves with G1/8 connections	Port G1/8 Flow rate 80 ... 140 l/min Metal valve - Mechanically actuated.		Online Catalogue PDF Documentation (EN)
Valves with G1/4 connections	Port G1/4 Flow rate 80 ... 600 l/min Metal valve		Online Catalogue PDF Documentation (EN)

6.5.3 Non-return valves and quick exhaust valves

Name	Remarks	Picture	Links
Piloted check valves HGL	Port M5, G1/8, G1/4, G3/8, G1/2 Flow rate 130 ... 1600 l/min Shut-off valve - Pneumatic piloted non-return valve		Online Catalogue Documentation (EN)
Non-return valves H, HA, HB	Connection: M5, G1/8, G1/4, G3/8, G1/2, G3/4 Push-in connector: 2, 4, 6, 8, 10, 12 mm Flow rate: 115 ... 2230 l/min Shut-off valve Screw-in		Online Catalogue Documentation (EN)
Quick exhaust valves SE, SEU	Connection G 1/8, G 1/4, G 3/8, G 1/2, G 3/4 Flow 300 ... 6 480 l/min Shut-off valve.		Online Catalogue Documentation (EN)

6.5.4 Pressure control valves

Name	Remarks	Picture	Links
Pressure regulator VRPA	Pressure regulator Connection M5, R1/8, R1/4 Push-in connector 4, 6, 8 mm Flow rate 80 ... 160 l/min Design type - Inline, without pressure gauge - Inline, with pressure gauge in MPA - L-shaped, with pressure gauge in MPA		Online Catalogue Documentation (EN)

6.5.5 One-way flow control valves

Name	Remarks	Picture	Links
One-way flow control valves GRxA, GRxZ	Connection M3, M5, G1/8, G1/4, G3/8, G1/2, G3/4, also available with NPT thread Push-in connection 3, 4, 6, 8, 10, 12 mm Flow rate 0 ... 4320 l/min. Non-return/flow control valve.		Online Catalogue Documentation (EN)
One-way flow control valves VFOE	Compact and light Fast and safe adjustment through "push-to-lock" Connection M5, M7, 1/8, 1/4, 3/8, 1/2 Plug connection 4, 6, 8, 10, 12 mm Flow rate 0 ... 1200 l/min for exhaust air and supply air		Online Catalogue Documentation (EN)

6.5.6 Proportional valves

Name	Remarks	Picture	Links
Proportional-pressure regulators VPPi	Connection G1/8 Flow rate 150 ... 1630 l/min 3-way proportional-pressure regulators Three predefined regulator presets, as well as the option of a custom preset		Online Catalogue Documentation (EN)
Proportional-pressure regulators VPPM	Connection G1/8, G1/4, G1/2 Flow rate: 380 ... 7000 l/min. 3-way proportional pressure regulators Choice of 3 regulator settings (fast, universal, precise) Display available as option		Online Catalogue Documentation (EN)

6.6 Valve terminals

6.6.1 Universal valve terminals

Name	Remarks	Picture	Links
Valve terminal VTUG-EX with multi-pin or fieldbus interface	Flow rate: 220 ... 630 l/min Width 10, 14 mm 4, 8, 12, 16, 24-fold Connection M5, M7, G 1/8 Plug connection 3, 4, 6, 8 mm Multi-pin, fieldbus, IO-Link, I-Port Voltage 24 V DC Pressure -0.9 ... 10 bar Degree of protection IP40 / IP67 / IP65 Sub-base valves Stainless steel coated manifold rail		Online Catalogue Documentation (EN)
Valve terminals MPA-L	Flow rate 160 ... 870 l/min. Width 10, 14 and 20 mm Push-in connector 3, 4, 6, 8, 10, 12 mm CTEU connection Protection class IP65, IP67 Valve functions 5/2, 5/3, 2x3/2, 2x2/2 and special functions		Online Catalogue Documentation (EN)

6.6.2 Valve terminals VTSA, ISO 15407-2, ISO 5599-2

Name	Remarks	Picture	Links
Valve terminal VTSA with CPX terminal	Control via fieldbus or control block Max. 32 valve positions/max. 32 solenoid coils Max. 10 electrical modules - Digital inputs/outputs - Analogue inputs/outputs - Parametrization of inputs and outputs - Convenient, integrated diagnostics - Preventive maintenance concepts Connecting thread: G.		Online Catalogue Documentation (EN)

6.6.3 Standards based valve terminals

Name	Remarks	Picture	Links
Manifold assemblies VTIA, ISO 15407-1	Flow rate: 400 ...1000 l/min Width: 18, 26 mm 2 ... 16 valves Voltage range: 12 V DC ... 230 V AC		Online Catalogue Documentation (EN)

6.7 Motion Terminal

6.7.1 Motion Terminal

Name	Remarks	Picture	Links
Motion Terminal VTEM	Flow rate: 480 l/min Voltage: 24 V DC Pressure: -0.9 ... 8 bar Degree of protection: IP65 Sub-base valves Metal manifold rail Fieldbus connection via modular electrical terminal CPX		Online Catalogue Documentation (EN)
Motion Apps	Motion apps are creating an entirely new dimension of flexibility - a single valve, numerous different functions Faster engineering processes Short response times without any hardware modifications Reduced system complexity Shorter rollout times for your software		Online Catalogue Documentation (EN)

6.8 Sensors

6.8.1 Sensors for T-slot

Name	Remarks	Picture	Links
Sensors SMT-8M-A	Electronic PNP, NPN Configurable Electrical connection M8, M12, open cable end ATEX 3GD 5 ... 30 V DC		Online Catalogue Documentation (EN)

6.8.2 Sensors for round groove

Name	Remarks	Picture	Links
Sensors SMT-10M	Electronic PNP, NPN Configurable Electrical connection M8, M12, open cable end 5 ... 30 V DC		Online Catalogue Documentation (EN)

6.8.3 Pressure and vacuum sensors

Name	Remarks	Picture	Links
Pressure sensors SPAU	Pressure measuring range -1 to 16 bar Voltage 20 ... 30 V DC Switching output 2x PNP or 2x NPN selectable Electrical output 0.1 ... 10 V, 1 ... 5 V, 4 ... 20 mA Pneumatic connection G1/8, R1/8, R1/4, NPT1/8, M5, M7, push-in connector 4 mm, 6 mm, 5/32" Pressure switch Vacuum switch		Online Catalogue Documentation (EN)

6.8.4 Flow sensors

Name	Remarks	Picture	Links
Flow sensors SFAW	Flow measuring ranges - 1.8 ... 32 l/min. - 5 ... 100 l/min. Switching output: 2x NPN or 2x PNP or IO-Link, selectable Analogue output - 0 ... 10 V - 1 ... 5 V - 4 ... 20 mA		Online Catalogue Documentation (EN)
Flow sensors SFAM	Flow measuring ranges: - 10 ... 1000 l/min - 30 ... 3000 l/min - 50 ... 5000 l/min - 100 ... 10,000 l/min - 150 ... 15,000 l/min Switching output - 2x NPN - 2x PNP Analogue output - 0 ... 10 V - 4 ... 20 mA		Online Catalogue Documentation (EN)

6.8.5 Air gap sensors

Name	Remarks	Picture	Links
Air gap sensors SOPA	Sensing range 20 ... 200 µm Pressure 4 ... 7 bar Switching outputs PNP or NPN Integrated air jet function Multi-coloured LCD display Filtered compressed air, lubricated or unlubricated H-rail, wall mounting, through-hole		Online Catalogue Documentation (EN)

6.9 Compressed air preparation

6.9.1 Series MS modular and configurable

Name	Remarks	Picture	Links
Service unit combination MSB6	Port G1/4, G3/8, G1/2, G3/4 Flow rate 1900 ... 5100 l/min		Online Catalogue Documentation (EN)
Service unit combination MSB9	Connection: G1/2, G3/4, G1, G1 1/4, G1 1/2 Flow rate: 5100 ... 14000 l/min		Online Catalogue Documentation (EN)
Energy efficiency module MSE6-C2M	Intelligent service unit component for energy-efficient operation of pneumatic systems. Combination of pressure regulator, on/off valve, sensor technology and fieldbus communication - regulated outlet pressure - detection of system downtime by flow measurement - stand-by pressure regulation - leakage detection - adjustable regulated pressure rise (soft-start) Expandable with CPX system		Online Catalogue Documentation (EN)
Energy efficiency module MSE6-E2M	Connection G1/2 Flow rate 4500 l/min. Pressure tightness testing Pressure indication Flow rate indication Consumption indication Fieldbus connection		Online Catalogue Documentation (EN)

6.9.2 Filter MS-LFR

Name	Remarks	Picture	Links
Filter regulator MS6-LFR	Port G1/4, G3/8, G1/2, G3/4 Flow rate 2200 ... 7200 l/min		Online Catalogue Documentation (EN)
Filter regulator MS9-LFR	Connection: G1/2, G3/4, G1, G1 1/4, G1 1/2 Flow rate: 3600 ... 21500 l/min		Online Catalogue Documentation (EN)
Filter regulator MS12-LFR	Port G1, G1 1/4, G1 1/2, G2 Flow rate 11000 ... 17000 l/min		Online Catalogue Documentation (EN)

6.9.3 Pressure regulators MS-LR

Name	Remarks	Picture	Links
Pressure regulators MS4-LR	Port G1/8, G1/4, G3/8 Flow rate 1000 ... 2100 l/min		Online Catalogue Documentation (EN)
Pressure regulators MS6-LR	Port G1/4, G3/8, G1/2, G3/4 Flow rate 2200 ... 7500 l/min		Online Catalogue Documentation (EN)
Pressure regulators MS9-LR	Connection: G1/2, G3/4, G1, G1 1/4, G1 1/2 Flow rate: 5000 ... 26500 l/min		Online Catalogue Documentation (EN)
Pressure regulators MS12-LR	Port G1, G1 1/4, G1 1/2, G2 Flow rate 12000 ... 22000 l/min		Online Catalogue Documentation (EN)

6.9.4 Precision pressure regulators MS-LRP

Name	Remarks	Picture	Links
Precision pressure regulators MS6-LRP	Port G1/4, G3/8, G1/2, G3/4 Flow rate 800 ... 5000 l/min		Online Catalogue Documentation (EN)

6.9.5 Soft-start/quick exhaust valves MS-SV

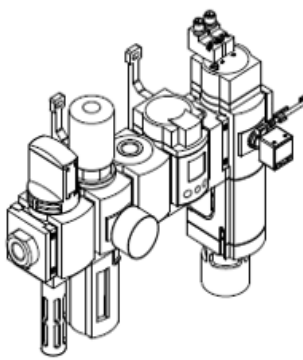
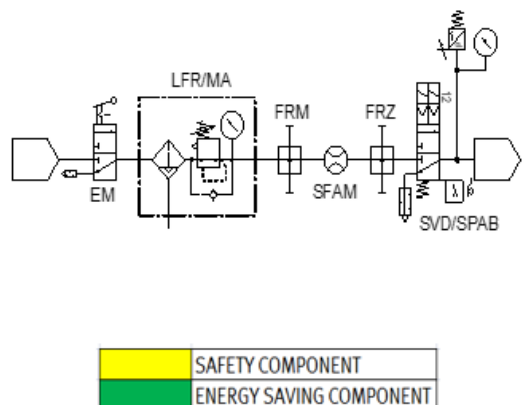
Name	Remarks	Picture	Links
Soft-start/quick exhaust valves MS6-SV	Size 6 Connection G1/2, also available with NPT thread Pressure 3.5 ... 10 bar Flow rate 4300 l/min Voltage 24 V DC Actuation solenoid actuated Pressure gauge with bar, psi, MPa 3/2-way valve Normally closed Silencer Flow direction - from left to right - from right to left.		Online Catalogue Documentation (EN)
Soft-start/quick exhaust valves MS9-SV	Size 9 Connection G3/4, G1, also available with NPT thread Pressure 3.5 ... 16 bar Flow rate: 16,000 l/min, Voltage 24 V DC, 110 V AC, 230 V AC Actuation Solenoid actuated Pressure gauge with bar, psi, MPa 3/2-way valve, normally closed Silencer		Online Catalogue Documentation (EN)

6.9.6 Branching modules MS-FRM

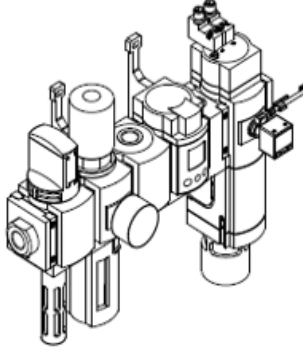
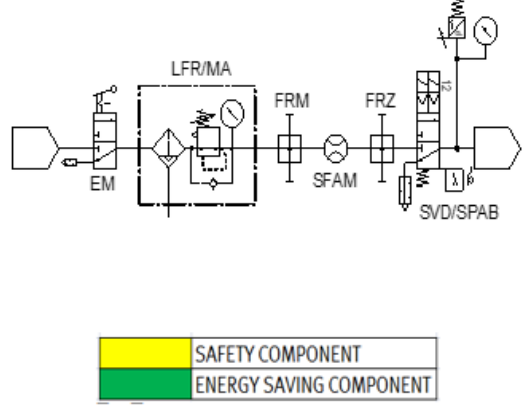
Name	Remarks	Picture	Links
Branching modules MS6-FRM	Port G1/4, G3/8, G1/2, G3/4 Flow rate 3200 ... 14700 l/min		Online Catalogue Documentation (EN)
Branching modules MS9-FRM	Connection: G1/2, G3/4, G1, G1 1/4, G1 1/2 Flow rate: 10,000 ... 50000 l/min		Online Catalogue Documentation (EN)
Branching modules MS12-FRM	Port G1, G1 1/4, G1 1/2, G2 Flow rate 25000 ... 42000 l/min		Online Catalogue Documentation (EN)

6.10 Examples of unit assembled air preparation

ORDER CODE	SYSTEM DESIGN	
IT_CS.1456075C	GTA MS6 G1/2" EM+LFR/MA+FRM+SFAM+FRZ+SVD/SPAU - Performance Level: "d"	Q.TY
SPLIT MATERIALS:	DESCRIPTION	
541268	On/off valve MS6-EM1-1/2-S	1
526490	Filt.regulator MS6-LFR-1/2-D7-E-R-V-A4	1
526782	Pressure gauge MA-50-1,6-R1/4-MPA-E-RG	1
529853	Branch module MS6-FRM-1/2	1
564938	Flow sensor SFAM-62-5000L-M-2SA-M12	1
549337	Distrib.block MS6-FRM-FRZ	1
548713	Soft s/qu.exh.v MS6-SV-1/2-D-10V24P-2M12-S3-A4	1
1901207	Silencer UOS-1-LF	1
8001208	Pressure sensor SPAU-P10R-T-R14M-L-PNLK-PNVBA-M12D	1

ORDER CODE	SYSTEM DESIGN	
IT_CS.1456075C	GTA MS6 G1/2" EM+LFR/MA+FRM+SFAM+FRZ+SVD/SPAU - Performance Level: "d"	Q.TY
SPLIT MATERIALS:	DESCRIPTION	
541268	On/off valve MS6-EM1-1/2-S	1
526490	Filt.regulator MS6-LFR-1/2-D7-E-R-V-A4	1
526782	Pressure gauge MA-50-1,6-R1/4-MPA-E-RG	1
529853	Branch module MS6-FRM-1/2	1
564938	Flow sensor SFAM-62-5000L-M-2SA-M12	1
549337	Distrib.block MS6-FRM-FRZ	1
548713	Soft s/qu.exh.v MS6-SV-1/2-D-10V24P-2M12-S3-A4	1
1901207	Silencer UOS-1-LF	1
8001208	Pressure sensor SPAU-P10R-T-R14M-L-PNLK-PNVBA-M12D	1

6.10.1 Pressure booster

Name	Remarks	Picture	Links
Pressure boosters DPA	Twin-piston pressure booster Pressure ratio 1:2 Pneumatic port G1/4, G3/8, G1/2 Supply pressure 2 ... 10 bar Output pressure 4 ... 16 bar Flow rate 300 ... 3000 NL/min Ambient temperature +5 ... +60°C.		Online Catalogue Documentation (EN)

6.11 Pneumatic fittings system

6.11.1 Standard O.D. tubing

Name	Remarks	Picture	Links
Standard O.D. tubing PUN-H, PUN-H-DUO	Outside diameter: 2 ... 16 mm Internal diameter: 2.1 ... 11 mm Temperature-dependent operating pressure: -0.95 ... 10 bar Ambient temperature: -35 ... 60° C Operating medium - Compressed air - Vacuum - Water		Online Catalogue Documentation (EN)
Standard O.D. tubing PUN-V0	Outside diameter: 4 ... 16 mm Internal diameter: 2 ... 11 mm Temperature-dependent operating pressure: -0.95 ... 10 bar Ambient temperature: -35 ... 60° C Operating medium - Compressed air - Vacuum		Online Catalogue Documentation (EN)

6.11.2 Push-in fittings

Name	Remarks	Picture	Links
Push-in fittings QSM, mini series	Connection M3, M5, M7, M 6x0.75, M 8x0.75, R1/8, G1/8, For outside tubing diameter 2, 3, 4, 6 mm Threaded connection - Metric thread with sealing ring - G thread with sealing ring - R thread with PTFE coating Suitable for vacuum Push-in fittings Push-in connectors Push-in bulkhead connectors Push-in caps Push-in connectors with push-in sleeves Blanking plugs Multiple distributors Push-in bulkhead fittings.		Online Catalogue Documentation (EN)
Push-in fittings QS, standard series	Port R1/8, R1/4, R1/2, R3/8, G1/8, G1/4, G1/2, G3/8, G3/4 For outside tubing diameter 4, 6, 8, 10, 12, 16, 22 mm Threaded port - G thread with sealing ring - R thread with PTFE coating Suitable for vacuum Push-in fittings Push-in connectors Push-in bulkhead connectors Push-in caps Push-in connectors with push-in sleeves Blanking plugs Multiple distributors Push-in bulkhead fittings.		Online Catalogue Documentation (EN)
Push-in fittings NPQM, metal, standard	Connection: M5, M7, G1/8, G1/4, G3/8, G1/2 For outside tubing diameter: 4, 6, 8, 10, 12, 14 mm Push-in sleeve: 4, 6, 8, 10, 12 mm Threaded connection: - G thread with sealing ring Push-in fittings Plug connectors Plug connectors with push-in sleeves		Online Catalogue Documentation (EN)

6.12 Other pneumatic equipment

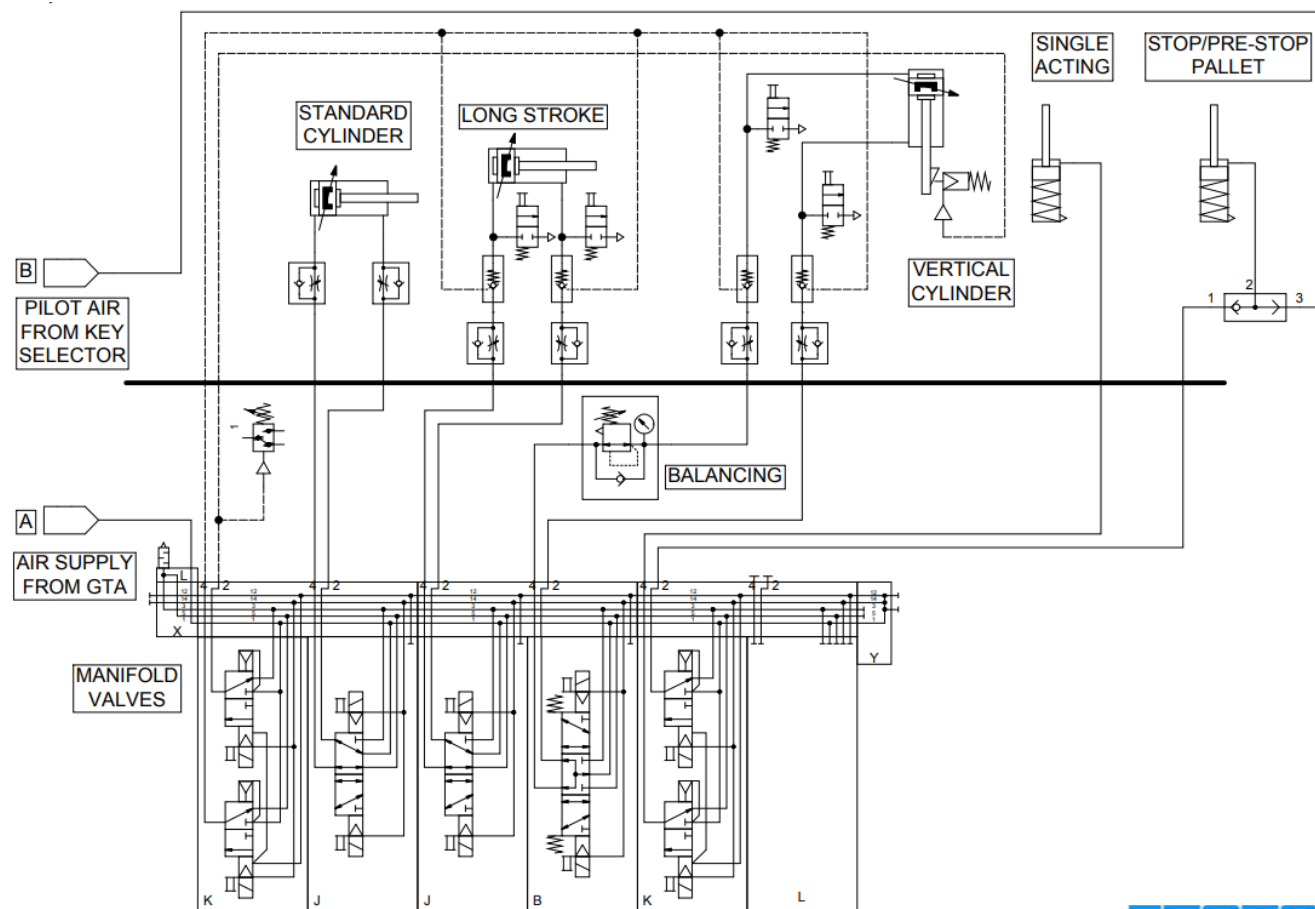
6.12.1 Silencers

Name	Remarks	Picture	Links
Silencers U	Threaded connection M5, G1/2, G1/4, G1/8, G3/8, G3/4, G1 Barbed connector connection PK-3, PK-4 Noise level 65 ... 84 dB(A).		Online Catalogue Documentation (EN)
Silencers UOS-1	Port thread G1 For soft-start and exhaust valves MS6-SV, MS series		Online Catalogue Documentation (EN)

6.12.2 Air pistols

Name	Remarks	Picture	Links
Air guns LSP	Air-saving function With lever operation Interchangeable nozzles		Online Catalogue Documentation (EN)
Air blower nozzles LPZ	With safety shield With noise absorption Straight pipe Elbow pipe.		Online Catalogue Documentation (EN)

7 Example Basic diagram for Cylinders Management in PWT assembly



ONLY AS EXAMPLE

FESTO

8 Example architecture safety B&W

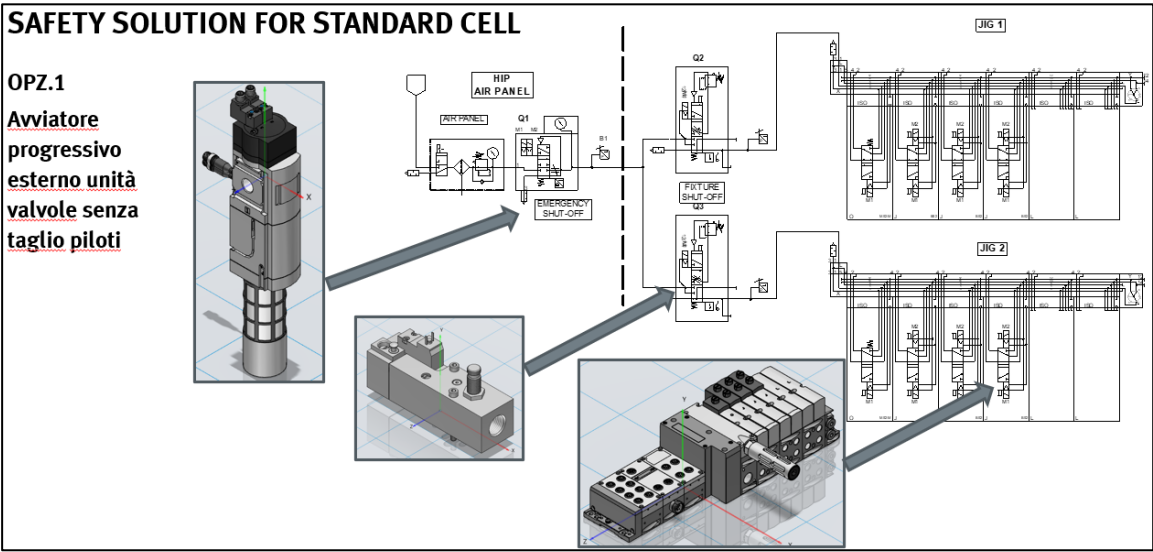
SUMMARY OF THE POSSIBLE SAFETY SOLUTIONS

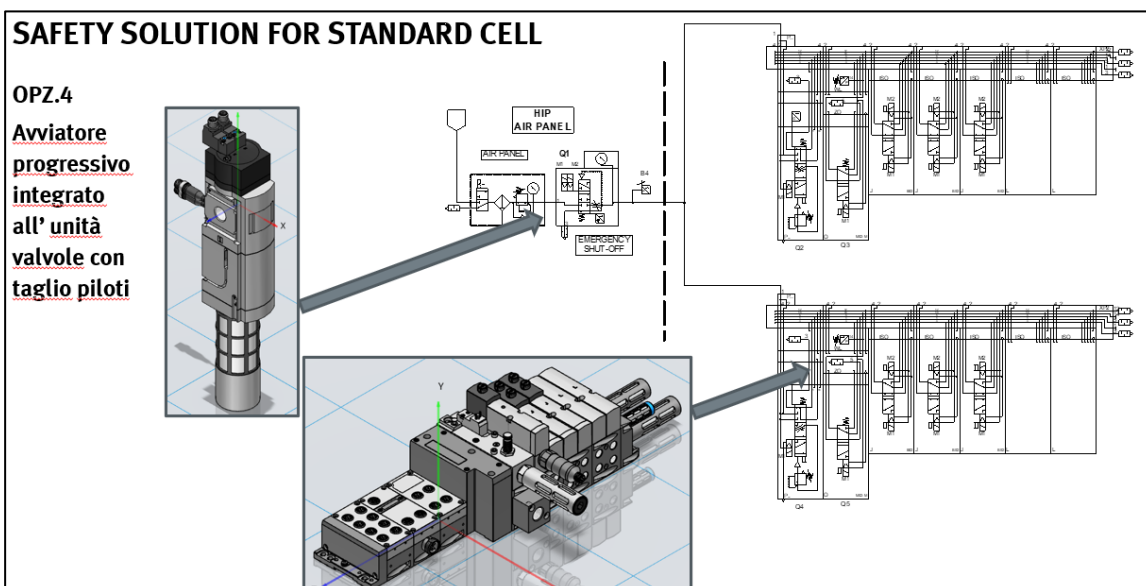
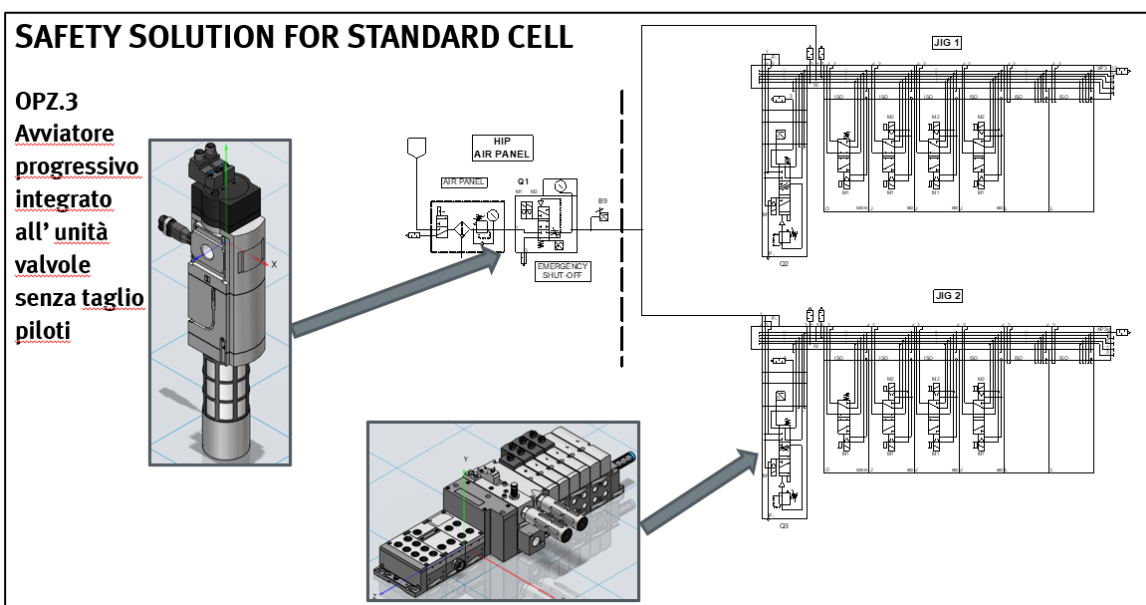
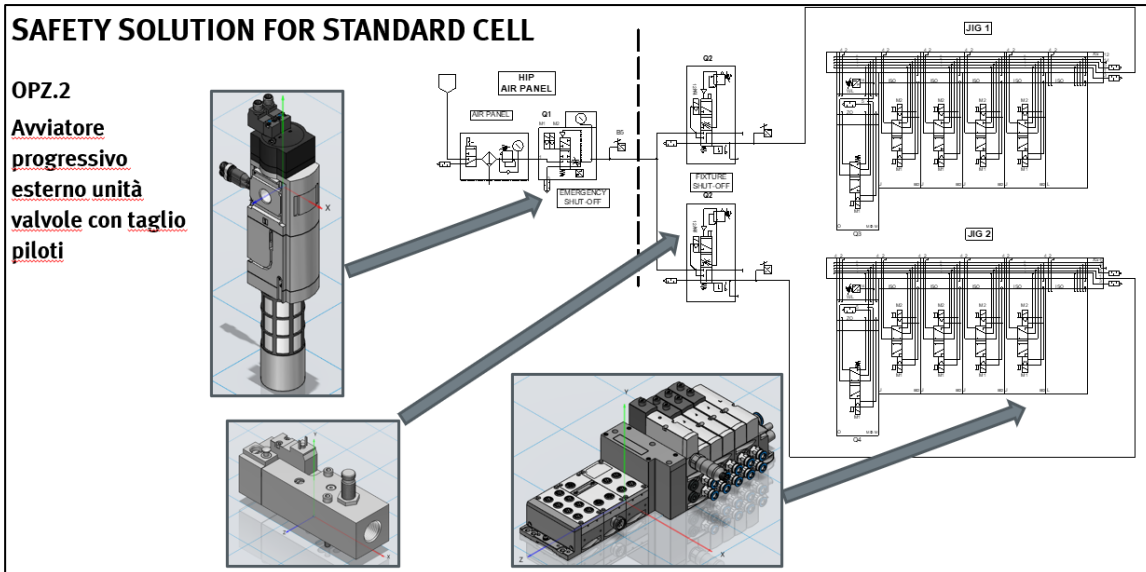
OPTION 1						
REF.	FUNCTION	* SAFETY FUNCTION.	** PL	b10	DC	POSITION
Q1	SOTF START/QUICK EXHAUST VALVE	STO + PUS	d	0,9 Mio Cyc	Sensor spool	HIP
Q2, Q3	SHUT OFF/SOFT START MODULE	STO	c/d	0,9 Mio Cyc	Pressure switch/Sensor spool	EXTERNAL

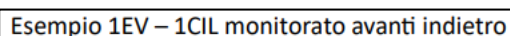
OPTION 2						
REF.	FUNCTION	* SAFETY FUNCTION.	** PL	b10	DC	POSITION
Q1	SOTF START/QUICK EXHAUST VALVE	STO + PUS	d	0,9 Mio Cyc	Sensor spool	HIP
Q2, Q3	SHUT OFF/SOFT START MODULE	STO	c/d	0,9 Mio Cyc	Pressure switch/Sensor spool	EXTERNAL
Q4, Q5	SWITCHING PILOT VALVE	PUS	d	10 Mio Cyc	Pressure switch/Sensor spool	INTEGRATED

OPTION 3						
REF.	FUNCTION	* SAFETY FUNCTION.	** PL	b10	DC	POSITION
Q1	SOTF START/QUICK EXHAUST VALVE	STO + PUS	d	0,9 Mio Cyc	Sensor spool	HIP
Q2, Q3	SHUT OFF/SOFT START MODULE	STO	c/d	0,9 Mio Cyc	Pressure switch/Sensor spool	INTEGRATED

OPTION 4						
REF.	FUNCTION	* SAFETY FUNCTION.	** PL	b10	DC	POSITION
Q1	SOTF START/QUICK EXHAUST VALVE	STO + PUS	d	0,9 Mio Cyc	Sensor spool	HIP
Q2, Q3	SHUT OFF/SOFT START MODULE	STO	c/d	0,9 Mio Cyc	Pressure switch/Sensor spool	INTEGRATED
Q4, Q5	SWITCHING PILOT VALVE	PUS	d	10 Mio Cyc	Pressure switch/Sensor spool	INTEGRATED

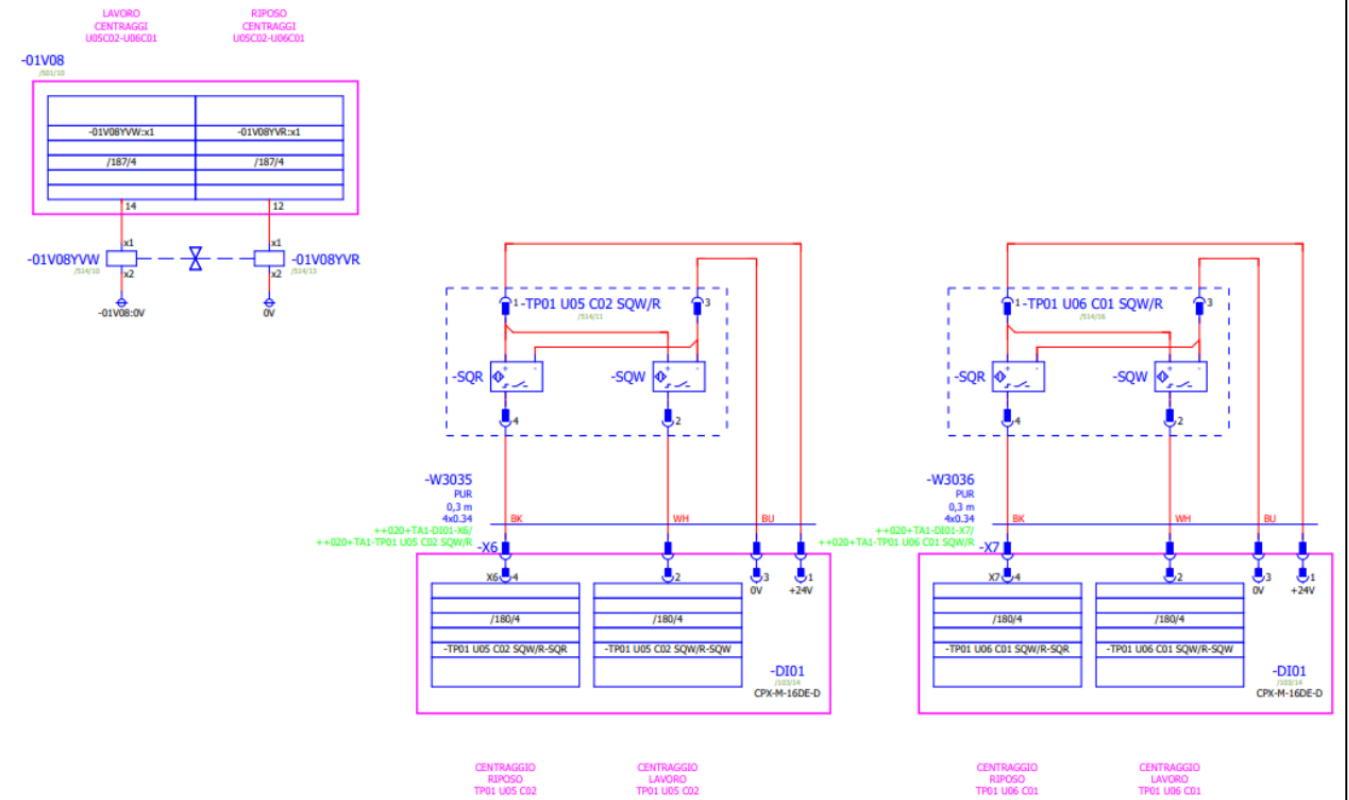




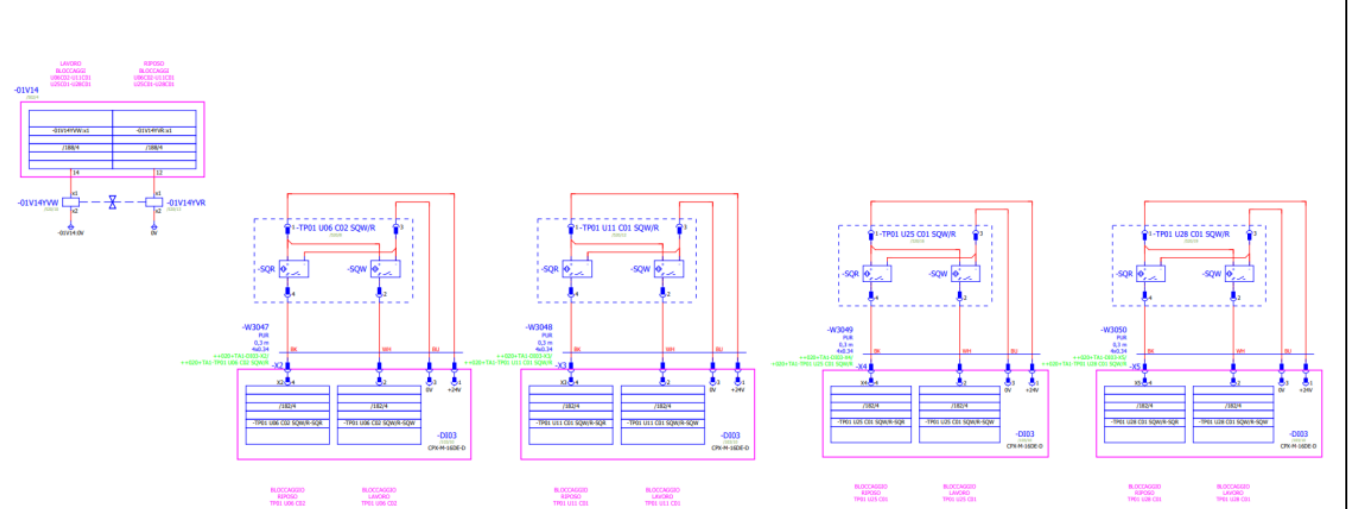


Example Basic diagram for Cylinders Management in B&W

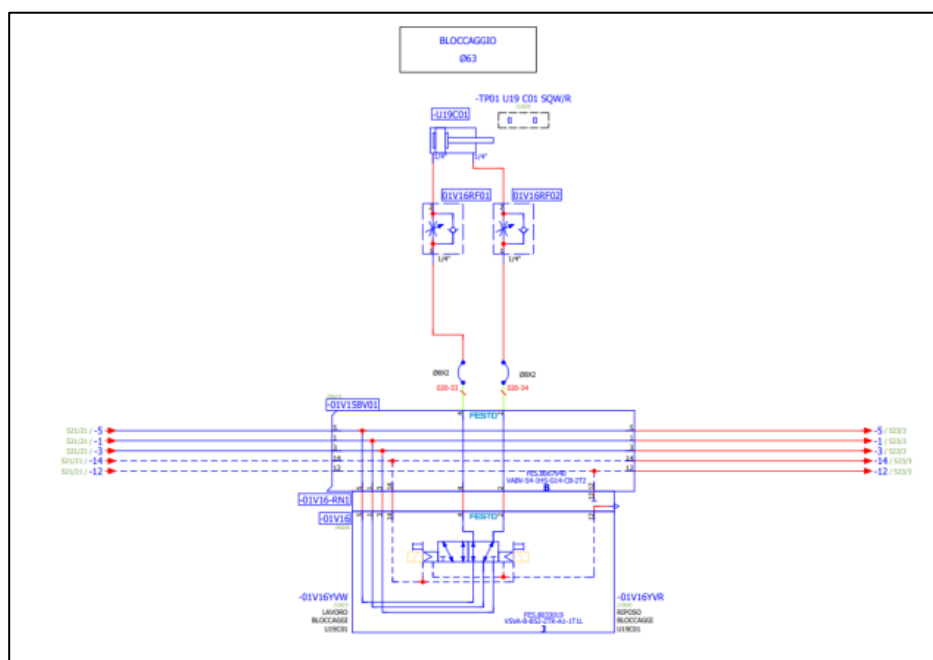
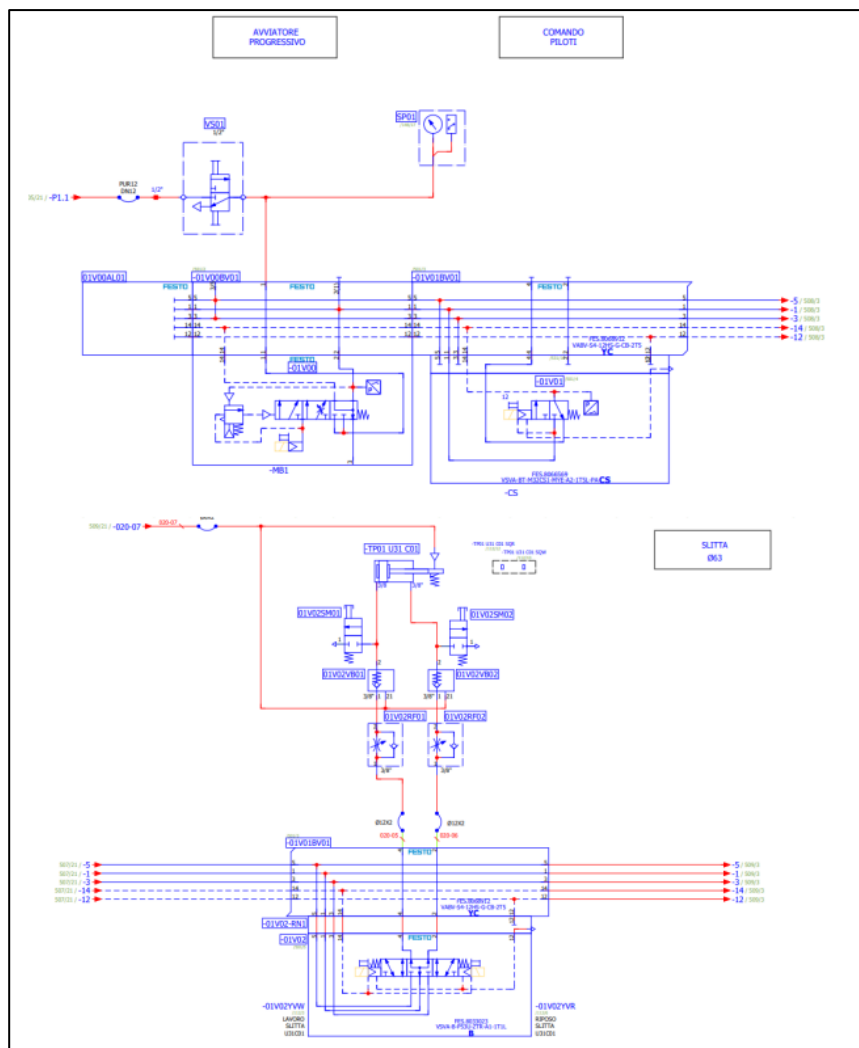
Esempio 1EV – 2CIL monitorati avanti indietro



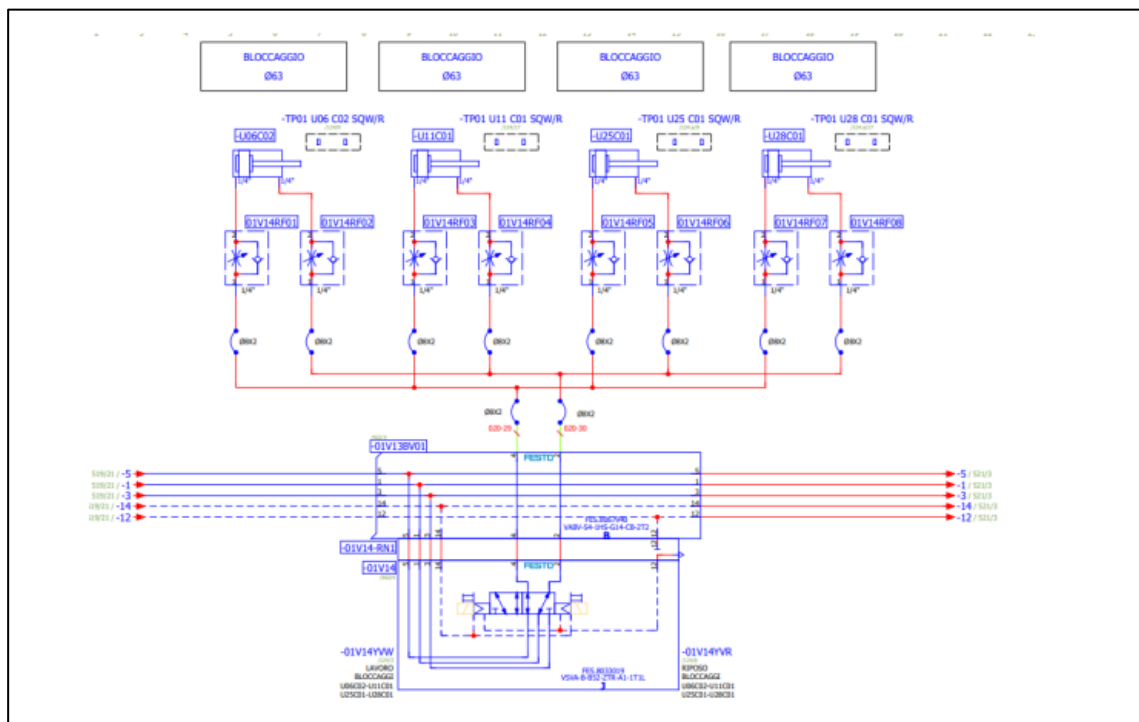
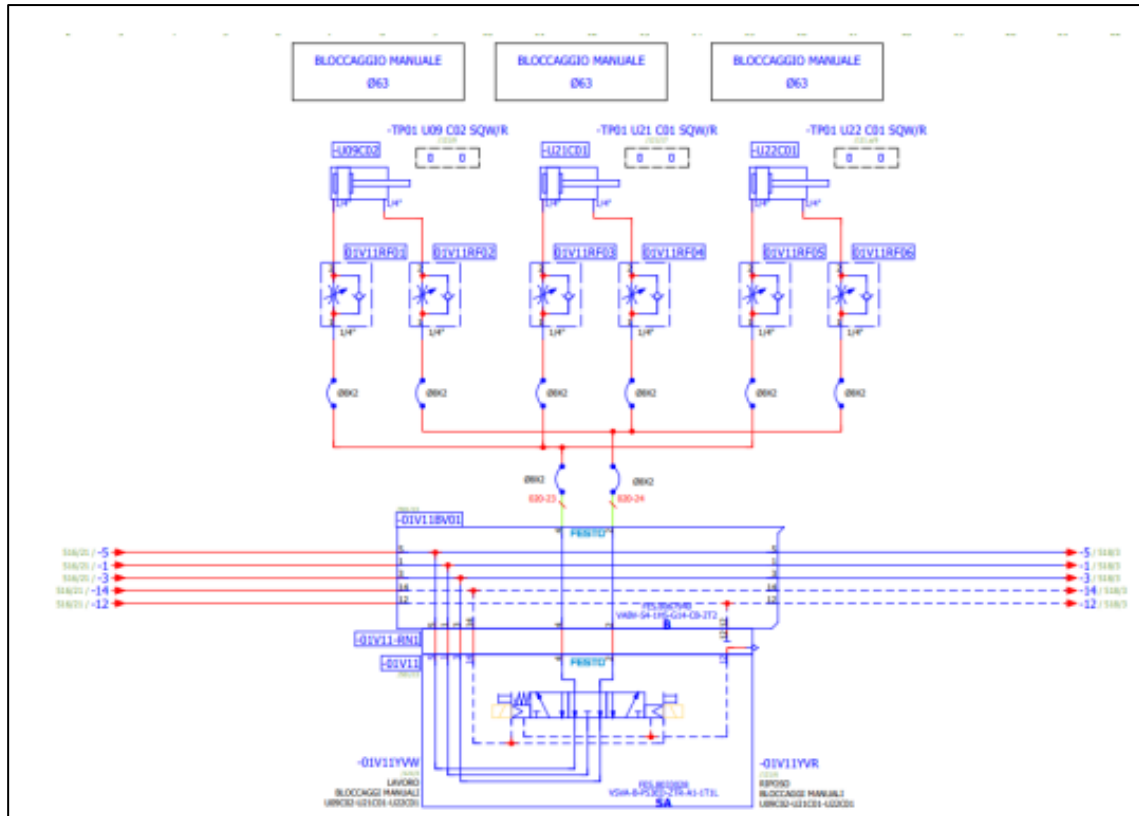
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Example Basic diagram for Cylinders Management in B&W



Example Basic diagram for Cylinders Management in B&W





You are always in the fast lane.
You create technological trends.
We set your machines in motion.

→ **WE ARE THE ENGINEERS
OF PRODUCTIVITY.**