DATA SHEET

Type 8647

bürkert
FLUID CONTROL SYSTEMS

AirLINE SP – electropneumatic automation system

- Direct connection to the I/O systems SIMATIC ET 200SP and SIMATIC ET 200SP HA
- Integration in Siemens PCS7 possible
- Combination of fieldbus, pilot valves and I/O modules
- Easy diagnostics by LC display
- Safety-related shut-off of valves possible

Product variants described in the data sheet may differ from the product presentation and description.

Can be combined with

Type 2012 ▸
Pneumatically operated 2/2 way globe valve CLASSIC

Type 8692 ▸
Digital electro-pneumatic positioner for integrated mounting on process control valves

Type 6524 ▸
3/2-way or 2 x 3/2-way solenoid valve for pneumatic applications

Type 6525 ▸
5/2-way solenoid valve for pneumatic applications

Type 8614 ▸
Pneumatic control cabinet solutions for hygienic process environments

Type description

The pneumatic valve island Type 8647 AirLINE SP is a modular, electropneumatic automation system consisting of connection and valve modules. It has been especially developed for safe and complete integration into the decentralised peripheral system “SIMATIC ET 200SP” and "SIMATIC ET 200SP HA" from Siemens. Pneumatically operated process valves, pneumatic cylinders or other pneumatic components can be connected to the pneumatic outputs. If the pneumatic components are installed with position feedbacks, the position of the actuated pneumatic components can be displayed on the associated pilot valve. This can save time on start-up and maintenance.

DTS 1000324658 EN Version: J Status: RL (released | freigegeben | validé) printed: 09.06.2022

Table of contents

DTS 1000324658 EN Version: J Status: RL (released | freigegeben | validé) printed: 09.06.2022

1. General technical data

1.1. General data

Note:
The general technical data refers to the pilot valves, Types 0460, 6524 and 6525.

Product properties	
Width per station	11 mm
Max. number of modules	Depending on application
Max. number valve functions	64 on one valve block; several valve blocks possible on one station[1.)]
Manual override	Standard
Circuit function	Detailed information can be found in chapter "3. Circuit functions" on page 7.
Performance data	
Flow rate	300 l/min[2.)]
Flow rate with integrated P shut-off	240 l/min
Flow rate: Q_{Nn} value air	Measured at +20 °C, 6 bar pressure at valve inlet and 1 bar pressure difference
Pressure range	Vac. up to 10 bar (with UL approval up to 8 bar)
Pressure values	Overpressure with respect to atmospheric pressure
Response time	Measured according to ISO 12238
Temperatures	
Ambient	0 °C…+55 °C (for impulse valve Type 0460: 0 °C…+50 °C)
Storage	-20 °C…+60 °C
Electrical data	
Circuit function	C (3/2 way), D (3/2 way), H (5/2 way), H (5/2 way) impulse. L + N (5/3 way) See "3. Circuit functions" on page 7.
Fieldbus type	PROFIBUS DP, PROFINET I/O
Electrical module	Siemens SIMATIC ET200SP and ET 200SP HA
Operating voltage	24 V DC
Voltage tolerance	±10 %
Residual ripple	2.4 Vss
Nominal power per valve	0.8 W (0.5 W Nominal power acc. to 120 ms)
Rated current per valve	40 mA (28 mA hold current after 120 ms) 20 mA (by use of Type 0460)
Medium data	
Operating medium	Compressed air, lubricated, oil free, dry; neutral gases (5 µm Filter recommended) ISO 8573-1: 2010, Class 7.4.4
Approvals and certificates	
Approval	ATEX, Zone 2 (BVS 18 ATEX E 078 X) IECEx, Zone 2 (IECEx BVS 18.0068X) UL approval (2018-2-28-E238179)
Protection class	IP20, IP65 in closed field housing

1.) With ET 200SP HA only one valve block possible. For details on max. station configuration, see manual.

2.) Maximum flow rate depending on valve function.

DTS 1000324658 EN Version: J Status: RL (released | freigegeben | validé) printed: 09.06.2022

1.2. AirLINE Quick technical data

Note:
The valves of Type 0460 cannot be installed with AirLINE Quick due to their size.

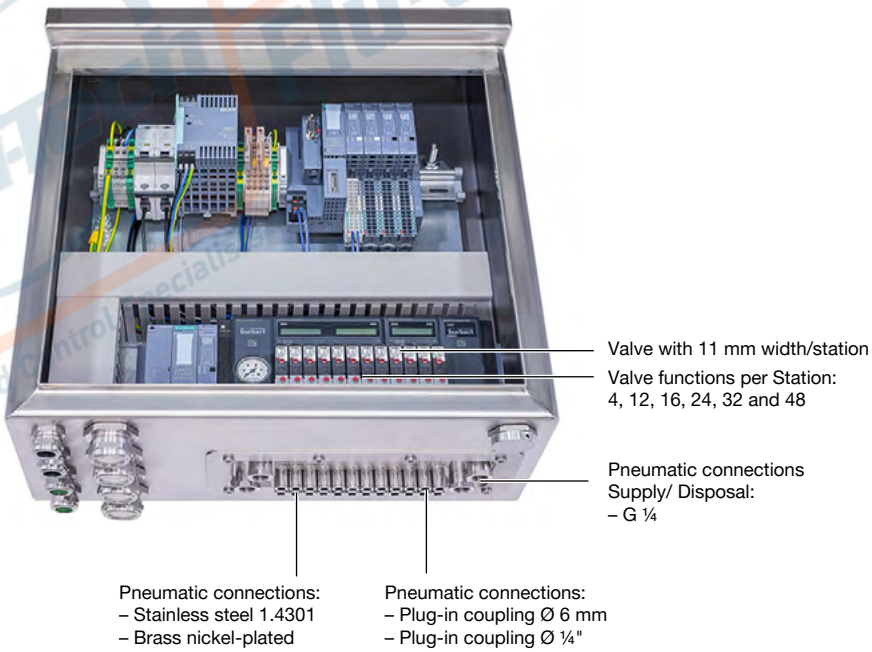
AirLINE Quick considerably reduces the use of components in the control cabinet. With the AirLINE Quick Adapter, the valve terminal is adapted directly to the control cabinet floor or wall.

Advantages:

- Reduced space requirement in the control cabinet
- This makes it possible to use more compact control cabinets
- Reduced installation effort due to hose connections directly at the bottom of the switch cabinet

Product properties	
Material: AirLINE Quick Adapter	Stainless steel 1.4301 Aluminium anodized
Material: pneumatic connection	Stainless steel 1.4301 brass nickel-plated
Valve functions per station	4, 12, 16, 24, 32 and 48
Process/Port connection & communication	
Connection: pneumatic feeding	G ¼
Connection: pneumatic service ports	Plug-in coupling Ø 6 mm, Ø ¼”
Environment and installation	
Installation	Wall control cabinet Floor control cabinet

AirLINE Quick Adapter in stainless steel 1.4301 oder anodized aluminium



DTS 1000324658 EN Version: J Status: RL (released | freigegeben | validé) printed: 09.06.2022

2. Product versions

2.1. Solenoid valves Type 6524 and Type 6525

- The pilot valves of **Type 6524** ▶ (single and double valve) and **Type 6525** ▶ (single valve) consist of a pilot flipper solenoid valve of Type 6144 and a pneumatic seat valve. The operating principle allows switching of high pressures with low power consumption and short switching times. The pilot valves are equipped with a manual override as standard.
- The pneumatic flange pattern of the pilot valves Type 6524 and 6525 (single valves) for Type 8647 REV. 2 has been standardised. There is a difference to the flange pattern of the pilot valves for Type 8647 REV. 1. It is therefore imperative to take into account the different article numbers of the pilot valves as described in chapter "7.3. Ordering chart replacement valves Type 6524 and Type 6525" on page 11.
- For detailed information regarding ordering information see "7.3. Ordering chart replacement valves Type 6524 and Type 6525" on page 11.

Pilot valve Type	**6524 / 6525**	**6524**
Circuit function	**3/2 and 5/2 way valve**	**2×3/2 way valve**
Product properties		
Materials		
Body	PA (Polyamide)	
Seal	FPM, NBR and PUR	
Width per station	11 mm	
Manual override	Standard	
Pneumatic module	With plug-in coupling, Ø 6 mm, Ø ¼"	
Performance data		
Pressure data	Overpressure to atmospheric pressure	
Flow rate (Q_{Nn} value air)	See "7.3. Ordering chart replacement valves Type 6524 and Type 6525" on page 11, measured at +20 °C, 6 bar pressure at the valve inlet and 1 bar pressure difference.	
Duty cycle	Continuous operation (100 % ED)	
Switching times	Measured according to ISO 12238	
Electrical data		
Nominal power	0.8 W	2×0.8 W
Electrical connection at the valve	Rectangular plug 2 pin grid spacing 5.08 mm Cable with leads[1.)]	Rectangular plug 3 pin grid spacing 2.54 mm Cable with leads[1.)]
Process/Port connection & communication		
Supply port connection 1 (P), 3 (R), 5 (S)	G ¼	
Service port 2 (A), 4 (B)	Plug-in coupling Ø 6 mm, plug-in coupling Ø ¼"	
Environment and installation		
Installation	As required, preferably with actuator upright	
Montage	With 2 screws M2×20	

1.) Versions with safety-related shutdown. The switching contact must be located in the same control cabinet as the valve block. The line length must be limited to a maximum of 2 m.

DTS 1000324658 EN Version: J Status: RL (released | freigegeben | validé) printed: 09.06.2022

2.2. Solenoid valve Type 0460

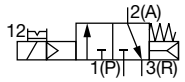
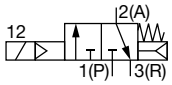
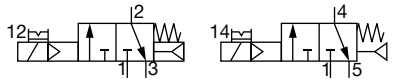
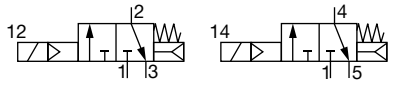
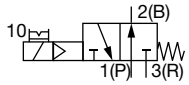
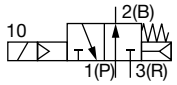
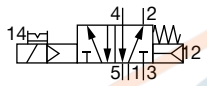
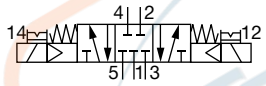
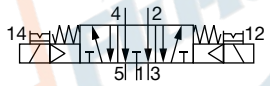
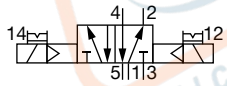
The pilot valve, **Type 0460** ▶, consists of a pneumatic valve body fitted with a double coil pilot valve. The principle allows switching of high pressures together with low power consumption and fast response times. All valves are equipped with manual override as a standard.

See "7.4. Ordering chart replacement valves Type 0460" on page 12.

Pilot valve Type	**0460**
Circuit function	**5/2 way and 5/3 way Impulse valve**
Product properties	
Materials	
Body	Aluminium
Seal	NBR
Width per station	11 mm
Manual override	Standard
Pneumatic module	With plug-in coupling, Ø 6 mm, Ø ¼
Performance data	
Pressure data	Overpressure to atmospheric pressure
Flow rate (Q_{Nn} value air)	See "7.3. Ordering chart replacement valves Type 6524 and Type 6525" on page 11, measured at +20 °C, 6 bar pressure at the valve inlet and 1 bar pressure difference.
Switching times	Measured according to ISO 12238
Electrical data	
Electrical connection at the valve	Rectangular plug 3 pin grid spacing 2,54 mm
Process/Port connection & communication	
Supply port connection 1 (P), 3 (R), 5 (S)	G ¼
Service port 2 (A), 4 (B)	Plug-in coupling Ø 6 mm, plug-in coupling Ø ¼"
Environment and installation	
Installation	As required, preferably with actuator upright
Montage	With 2 screws M1,7 × 23

DTS 1000324658 EN Version: J Status: RL (released | freigegeben | validé) printed: 09.06.2022

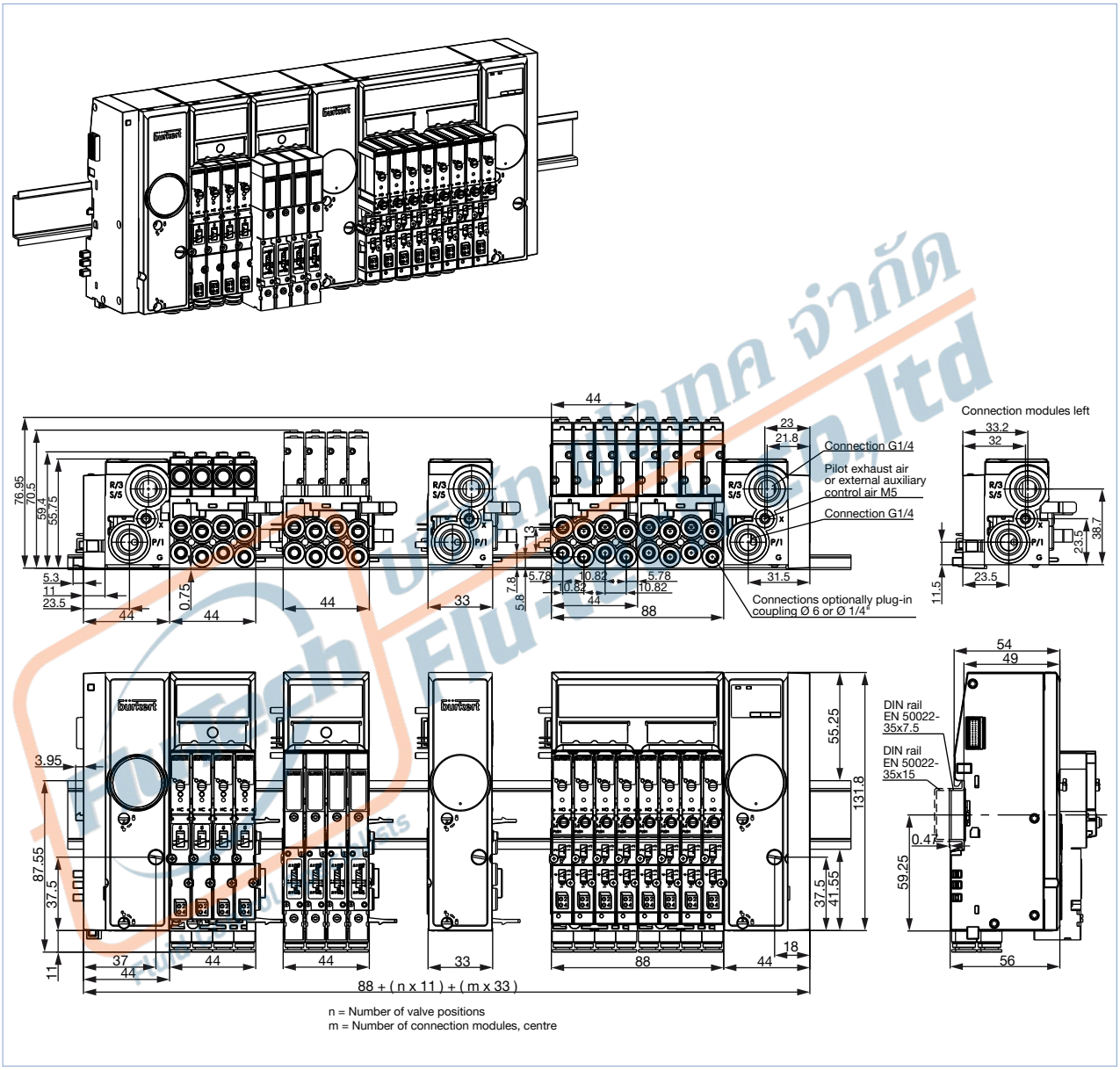
3. Circuit functions

Circuit Function	Description
	**Type: C, solenoid valve** 3/2 way Servo-controlled, with manual mode Normally closed
	**Type: C, solenoid valve** 3/2 way Servo-controlled Normally closed
	**Type: C, solenoid valve** 2 x 3/2 way Servo-controlled, with manual mode Normally closed
	**Type: C, solenoid valve** 2 x 3/2 way Servo-controlled Normally closed
	**Type: D, solenoid valve** 3/2 way Servo-controlled, with manual mode Normally open
	**Type: D, solenoid valve** 3/2 way Servo-controlled Normally open
	**Type: H, solenoid valve** 5/2 way Servo-controlled, pilot air and manual mode Pressure applied via port (1), therefore one of the two ports (2) or (4) is under pressure.
	**Type: L, solenoid valve** 5/3 way With manual mode In middle position all ports locked Normally closed
	**Type: N, solenoid valve** 5/3 way With manual mode In middle position ports 2 and 4 exhausted There is always one of the two outlet ports (2) or (4) pressurized when coil is activated.
	**Type: Z, solenoid valve** 5/2 way Impulse version with 2 coils and manual mode Normally open Pressure applied via port (1), therefore one of the two ports (2) or (4) is under pressure.

DTS 1000324658 EN Version: J Status: RL (released | freigegeben | validé) printed: 09.06.2022

4. Dimensions

Note:
Dimensions in mm



5. Product installation

5.1. Installation notes

- External-Valve-Shut-off function (EVS function): The switching contact must be located in the same control cabinet as the valve block. The line length must be limited to a maximum of 2 m.
- HotSwap function of the individual valves cannot be combined with the ATEX/IEC-Ex approval.
- The following project planning and commissioning restrictions must be observed.

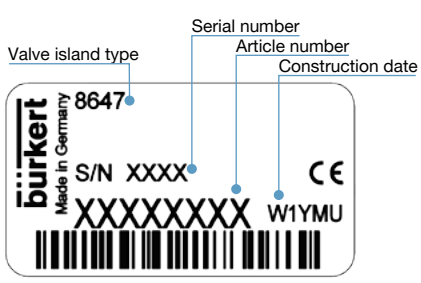
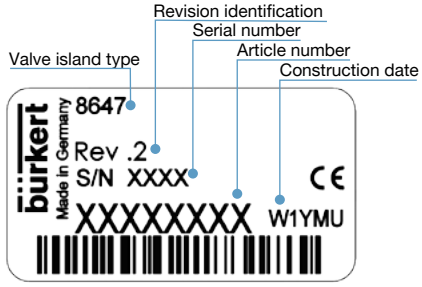
Description	Type 8647 combines with	
	ET 200SP	ET 200SP HA
Installation with standard file PROFINET IO (GSDML)	Yes	Yes
Installation with standard file PROFIBUS DP (GSD)	Yes	No
Full integration in Software STEP 7 Classic (HSP)	Yes	No
Full integration in Software STEP 7 TIA-Portal (HSP)	Yes	No
Full integration in Software PCS 7 V9.0 SP2 (HUP)	Yes (HF Interface module required)	Yes
Several valve blocks can be arranged in series in one station	Yes (new power supply necessary)	No
Link to Siemens homepage	**Assembly limits for Siemens ET 200SP ▸**	**Assembly limits for Siemens ET 200SP HA ▸**
New power supply (ET 200SP base unit) required upstream of the valve block	Recommended, but not mandatory	Yes (mandatory) (base unit cover required)
Further ET 200SP modules can be mounted to the right of the valve block	Yes	No

6. Product design and assembly

6.1. Notes on compatibility and revision levels

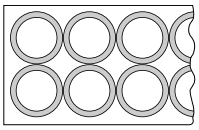
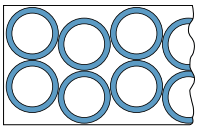
The single valves of the Types 6524 and 6525, the pneumatic basic and connection modules and the AirLINE Quick control cabinet base adaption have been revised due to various optimisations.

Distinguishing features valve island

Revision island	8647 REV. 1[1.)]	8647 REV. 2
Visual differentiation		
Marking on type plate		

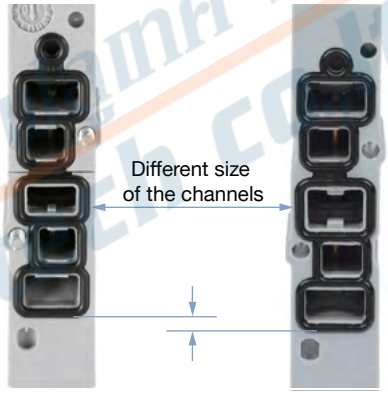
1.) If you have any questions regarding the differences in revisions, please contact your Bürkert sales representative.

Distinguishing features module

Revision island	8647 REV. 1[1.)]	8647 REV. 2
Channel arrangement of the working connections	 parallel	 wavy
Colour of the release rings (hose connector)	black	blue
Flow reduction with integrated P shut-off	Up to 50 %	Up to 20 %

1.) If you have any questions regarding the differences in revisions, please contact your Bürkert sales representative.

Distinguishing features valves

Valves 6524/6525	Valve REV. 1	Valve REV. 2
Article no.	Distinguishing by Article no. see “7.3. Ordering chart replacement valves Type 6524 and Type 6525” on page 11	
Visual distinction	 **REV. 1** Single valves Type 6524 and Type 6525 with flange interface „FM14“ Different size of the channels **REV. 2** Single valves Type 6524 and Type 6525 with flange interface „FM20“	
Information label	There is a corresponding information label on the relevant valve which indicates that the valve has been overhauled. This information label must be removed before assembly.	

For further details, see operating instructions **Type 8647** ▶, chapter 5.4.

7. Ordering information

7.1. Bürkert eShop – Easy ordering and quick delivery

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7.2. Bürkert product filter

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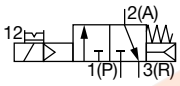
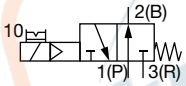
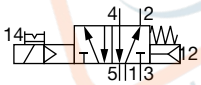
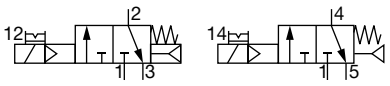
7.3. Ordering chart replacement valves Type 6524 and Type 6525

Note:
For detailed information on the corresponding product version, see "2.1. Solenoid valves Type 6524 and Type 6525" on page 5.

Circuit function	Orifice	Q_{Nn} value air[1.]	Pressure range	Switching times		Voltage/ Frequency	Article no.	
				Opening	Closing		Valves Rev. 1 for 8647 Rev. 1[3.]	Valves Rev. 2 for 8647 Rev. 2[3.]
	[mm]	[l/min]	[bar]	[ms]	[ms]	[V/Hz]		
Type: C, solenoid valve 3/2 way Servo-controlled, with manual mode Normally closed 	4.0	300	Vac.…7	15	20	24 V DC	20029915 (186258)[4.]	20029923 (20013119)[4.]
			1…10[2.]	15	20	24 V DC	20029913 (186257)[4.]	20029921 (20013114)[4.]
			2.5…10	15	28	24 V DC	20029910 (184043)[4.]	20029918 (365606)[4.]
Type: D, solenoid valve 3/2 way Servo-controlled, with manual mode Normally open 	4.0	300	2.5…10	15	28	24 V DC	20029911 (184400)[4.]	20029919 (365609)[4.]
Type: H, solenoid valve 5/2 way Servo-controlled, pilot air and manual mode Pressure applied via port (1), therefore one of the two ports (2) or (4) is under pressure. 	4.0	300	1…10[2.]	15	20	24 V DC	20029914 (186271)[4.]	20029922 (20013117)[4.]
			2.5…10	20	28	24 V DC	20029912 (179938)[4.]	20029920 (365610)[4.]
Type: C, solenoid valve 2 x 3/2 way Servo-controlled, with manual mode Normally closed 	4.0	300	1…10[2.]	12	20	24 V DC	300817	
			2.5…10	12	20	24 V DC	204710	

1.) With integrated HotSwap and/or non-return function, see chapter "Distinguishing features module" on page 10.

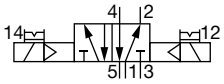
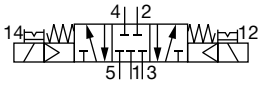
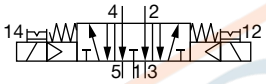
2.) Version with auxiliary pilot air

3.) If you have any questions regarding the compatibility of the valve revision, please contact your Bürkert sales representative.

4.) The valve article number can no longer be ordered. Please order superior set.

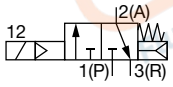
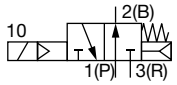
DTS 1000324658 EN Version: J Status: RL (released | freigegeben | validé) printed: 09.06.2022

7.4. Ordering chart replacement valves Type 0460

Circuit function	Orifice	Q_{Nn} value air	Pressure range	Switching times		Nominal power	Article no. Valve Rev. 1 for 8647 Rev.1, 2 & 3
	[mm]	[l/min]	[bar]	Opening [ms]	Closing [ms]	[W]	
Type: Z, solenoid valve 5/2 way Impulse version with 2 coils and manual mode Normally open Pressure applied via port (1), therefore one of the two ports (2) or (4) is under pressure. 	2.5	200	2.0…7.0	15	15	0.5	154183
Type: L, solenoid valve 5/3 way With manual mode In middle position all ports locked Normally closed 	2.5	200	2.0…7.0	15	20	1	154184
Type: N, solenoid valve 5/3 way With manual mode In middle position ports 2 and 4 exhausted There is always one of the two outlet ports (2) or (4) pressurized when coil is activated. 	2.5	200	2.0…7.0	15	20	1	154185

7.5. Ordering chart replacement valves Type 6524 and Type 6525 with second connection for shut-off function

3/2 way solenoid valve without manual override

Circuit function	Orifice	Q_{Nn} value air	Pressure range	Voltage/ frequency	Article no. Valve Rev. 1 for 8647 Rev. 1	Article no. Valve Rev. 2 for 8647 Rev. 2
	[mm]	[l/min][1.]	[bar][2.]	[V/Hz]		
Type: C, solenoid valve 3/2 way Servo-controlled Normally closed 	4	300	Vac....10[3.]	24 V DC	On request	On request
			1…10	24 V DC	On request	On request
			2.5…10	24 V DC	20029916 (285545)[4.]	20029924 (20013136)[4.]
Type: D, solenoid valve 3/2 way Servo-controlled Normally open 	4	300	2.5…10	24 V DC	On request	On request

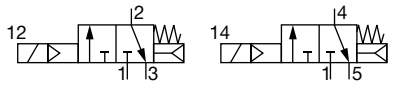
1.) Measured at +20 °C, 6 bar pressure at valve inlet and 1 bar pressure difference

2.) Measured as overpressure to the atmospheric pressure

3.) Version with auxiliary pilot air

4.) The valve article number can no longer be ordered. Please order superior set.

2×3/2 way solenoid valve without manual override

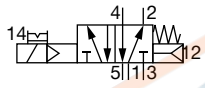
Circuit function	Orifice	Q_{Nn} value air	Pressure range	Voltage/ frequency	Integrated power reduction	Article no. Valve Rev. 1 for 8647 Rev.1 & 2
	[mm]	[l/min][1.]	[bar][2.]	[V/Hz]		
Type: C, solenoid valve 2 x 3/2 way Servo-controlled Normally close 	4	300	Vac…10[3.]	24 V DC	No	On request
	–	–	2.5…10	24 V DC	No	300818

1.) Measured at +20 °C, 6 bar pressure at valve inlet and 1 bar pressure difference

2.) Measured as overpressure to the atmospheric pressure

3.) Version with auxiliary pilot air

5/2 way solenoid valve without manual override

Circuit function	Orifice	Q_{Nn} value air	Pressure range	Switching times		Voltage/ frequency	Article no. Valve Rev. 1 for 8647 Rev. 1	Article no. Valve Rev. 2 for 8647 Rev. 2
	[mm]	[l/min]	[bar]	Opening [ms]	Closing [ms]	[V/Hz]		
Type: H, solenoid valve 5/2 way Servo-controlled, pilot air and manual mode Pressure applied via port (1), therefore one of the two ports (2) or (4) is under pressure. 	4	300	2.5…10	20	28	24 V DC	20029917 (285544)[1.]	20029925 (20013137)[1.]

1.) The valve article number can no longer be ordered. Please order superior set.

7.6. Ordering chart accessories

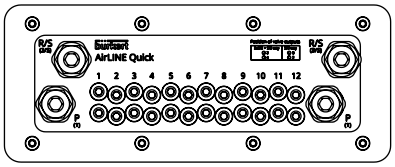
Covering plates

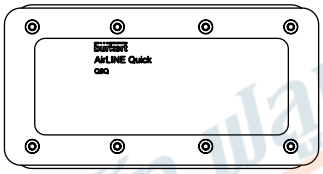
Note:
If not all valve positions on a pneumatic base module are used on a valve terminal, this valve position must be provided with a covering plate to ensure full functionality of the valve terminal.

Covering plates	Article no.
Covering plate for solenoid valves Type 6524/6525 (Rev. 1)	650373
Covering plate for solenoid valves Type 6524/6525 (Rev. 2)	661092
Covering plate for solenoid valves Type 6524 2 × 3/2 way valve	661092

Blind plates

Note:
A blind plate is used to cover an existing flange interface for AirLINE Quick on control cabinet wall or on the control cabinet floor.



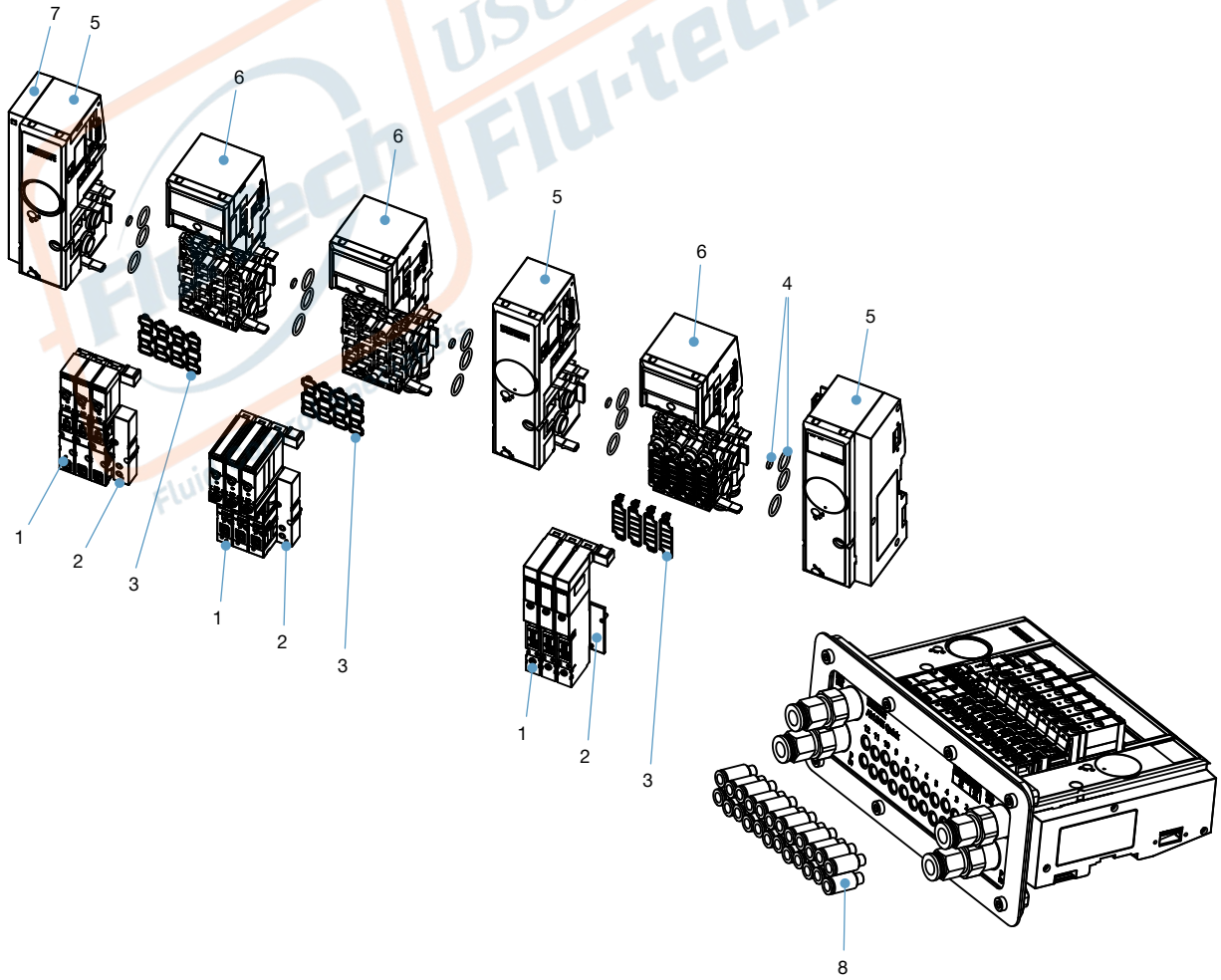


Material	Number of valve positions	Article no.
Stainless steel 1.4301	4	246938
	8	246934
	12	246930
	16	246926
	16 with Intermediate supply	246936
	24	246928
	24 with Intermediate supply	246932

DTS 1000324658 EN Version: J Status: RL (released | freigegeben | validé) printed: 09.06.2022

7.7. Ordering chart spare parts

Pos.	Description	Content	Article no.
1	Replacement valves	–	See “7.3. Ordering chart replacement valves Type 6524 and Type 6525” on page 11
2	Cover plates	–	See “7.6. Ordering chart accessories” on page 14
3	**Set of valve seals**		
	Profile seal set pilot valve Type 6524, 2x 3/2 way	12 seals	20016305
	Profile seal set pilot valve Type 6525, REV. 1	12 seals	20024334
	Profile seal set pilot valve Type 6525, REV. 2	12 seals	20016305
	Profile seal set pilot valve Type 6524, 3/2 way, REV. 1	12 seals	20024333
	Profile seal set pilot valve Type 6524, 3/2 way, REV. 2	12 seals	20024336
	Profile seal set pilot valve Type 0460	12 seals	20024330
4	Set of seals modules	12 seals	20024339
5	Connection assemblies	On request	On request
6	Valve module assemblies	On request	On request
7	Set interface unit, left	1	20029826
8	Set of hose connectors Ø 6 mm brass	8	20024340
	Set of hose connectors Ø 6 mm VA	8	20024341



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