

Phillips[®]
REFRIGERATION
VALVES • VESSELS • SYSTEMS • CONTROLS

770 Enterprise Avenue
DeKalb, IL 60115
P: (630) 377-0050
F: (630) 377-2706
info@haphillips.com

ENGINEERING
TOMORROW

Danfoss

Industrial Refrigeration Valves, Controls, and Components
Presented by Phillips Refrigeration

2021 Danfoss List Pricing

Unlock the potential of your
industrial refrigeration system

Effective January 18, 2021

New
products
for 2021.



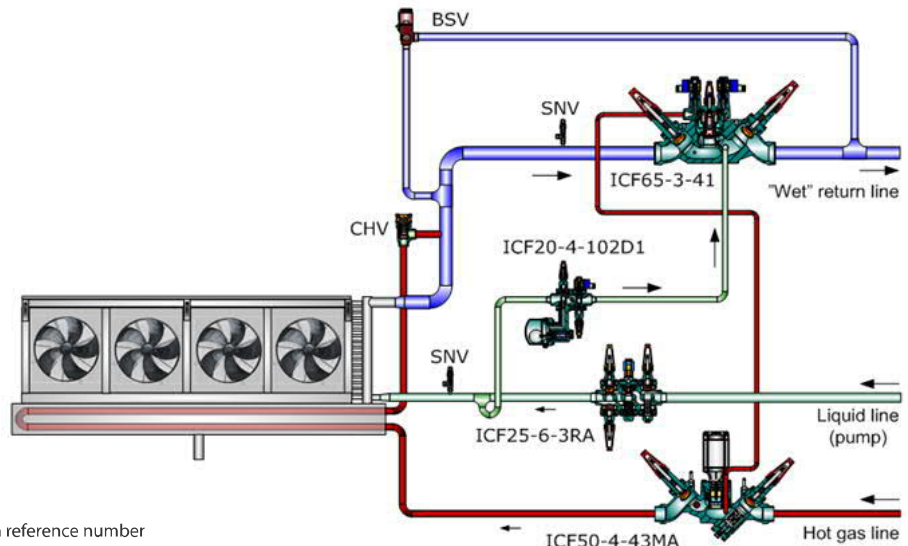
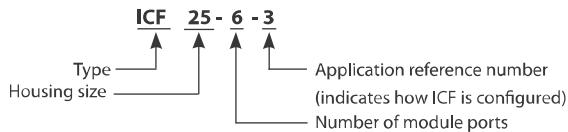
danfoss.us/ir-pricelist

CONTENTS

DESCRIPTION	TYPE	PAGE
Valve Stations	ICF	4-11
Shut-off Valves	SVA	12-15
Check Valves	SCA/CHV/NRVA	16-17
Hand Expansion Valves	REG	18
Pressure Regulating Valves	ICS	19-21
Flanged Drop-in replacement	ICS-(H)S4A/(H)A4A	22
Pilot Valves for ICS/PM		23
Ammonia Pressure Gauges		23
Gauge, Purge, and Needle Valves	SNV-ST/SNV-SS	24
Solenoid Valves	EVRA/EVRAT/ICS	25
Dual Position Solenoid Valves	ICS-H	26
Coils for Solenoid Valves		26
Electronic Expansion Valves	AKVA	27
Motorized Valves	ICM	28
Flanged Motorized Valves	ICM-HMMR/V	29
Strainers (Filters)	FA/FIA	30-31
Gas Powered Stop Valves	ICLX	32
Filter Driers	DCR	32
Liquid Level Sensors	AKS 4100U	33
Liquid Level Glasses	LLG	34
Level Eye® (Liquid Level Sight Glasses)		34
Oil Drain Valves	QDV	35
Float Switches	AKS 38	35
Gas Detectors and Accessories	GD/GDH	36-37
Pressure and Temperature Sensors	AKS/MBT	38
Electronic Controllers	EKC/EKE	39-40
Terms and Conditions		41-43

Typical installation with ICF valve stations

ICF nomenclature



Common ICF applications

Application #1 is typically used for:
Pumped liquid lines in flooded systems without hot gas defrost

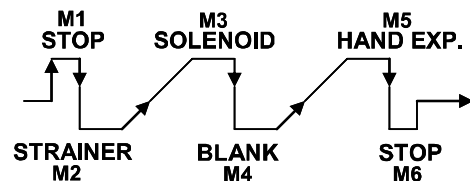
Application #1 has the following valve functions:

Stop valve, strainer, solenoid with manual stem, HEV, stop valve

Type	Connection Type/Size	Part No. *	List Price *
ICF20-6-1RA	3/4" SW	027L3005	\$1,841
ICF20-6-1RA	1" SW	027L3007	\$1,933
ICF20-6-1HRB	1" SW	027L3408	\$2,386
ICF20-6-1HRB	1 1/4" SW	027L3409	\$2,499
ICF25-6-1RA	1" SW	027L4003	\$2,411
ICF25-6-1RB	1 1/4" SW	027L4013	\$2,531
ICF25-6-1RB	1 1/2" SW	027L4017	\$2,705

* Price does not include coil. Coil must be ordered separately; see page 26 for coil ordering.

Application #1 example: ICF 25-6-1RA



Stainless Steel ICF-SS, Application #1

Application #1 has the following valve functions:

Stop valve, strainer, solenoid with manual stem, HEV, stop valve

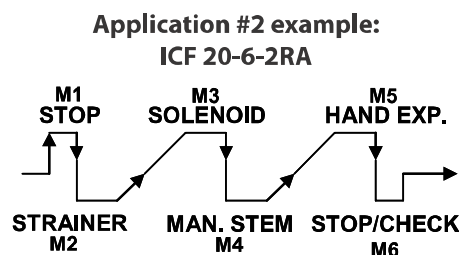
Type	Connection Type/Size	Part No. *	List Price *
ICF-SS20-6-1RA	3/4" BW Sch 40	027L3555	\$3,222
ICF-SS20-6-1RA	1" BW Sch 40	027L3556	\$3,383
ICF-SS20-6-1HRB	1" BW Sch 40	027L3578	\$4,175
ICF-SS20-6-1HRB	1 1/4" BW Sch 40	027L3557	\$4,373
ICF-SS25-6-1RA	1" BW Sch 40	027L3568	\$4,220
ICF-SS25-6-1RB	1 1/4" BW Sch 40	027L3584	\$4,429
ICF-SS25-6-1RB	1 1/2" BW Sch 40	027L3570	\$4,732

* Price does not include coil. Coil must be ordered separately; see page 26 for coil ordering.

**Application #2 and 3 are typically used for:
Pumped liquid lines in flooded systems with hot gas defrost**

Application #2 has the following valve functions: Stop valve, strainer, solenoid with manual stem, HEV, stop/check valve			
Type	Connection Type/Size	Part No. *	List Price *
ICF20-6-2RA	¾" SW	027L3014	\$1,933
ICF20-6-2RA	1" SW	027L3016	\$2,030
ICF20-6-2HRB	1" SW	027L3412	\$2,505
Application #3 has the following valve functions: Stop valve, strainer, solenoid with manual stem, check valve, HEV, stop valve			
Type	Connection Type/Size	Part No. *	List Price *
ICF20-6-3HRB	1" SW	027L3416	\$2,505
ICF25-6-3RA	1" SW	027L4021	\$2,532
ICF25-6-3RB	1¼" SW	027L4031	\$2,658
ICF25-6-3RB	1½" SW	027L4035	\$2,866

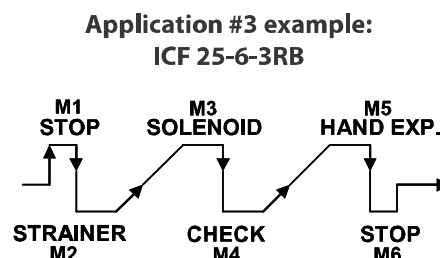
* Price does not include coil. Coil must be ordered separately; see page 26 for coil ordering.



Stainless Steel ICF-SS, Application #2 and 3

Application #2 has the following valve functions: Stop valve, strainer, solenoid with manual stem, HEV, stop/check valve			
Type	Connection Type/Size	Part No. *	List Price *
ICF-SS20-6-2RA	¾" BW Sch 40	027L3571	\$3,383
ICF-SS20-6-2RA	1" BW Sch 40	027L3572	\$3,553
Application #3 has the following valve functions: Stop valve, strainer, solenoid with manual stem, check valve, HEV, stop valve			
Type	Connection Type/Size	Part No. *	List Price *
ICF-SS20-6-3HRB	1" BW Sch 40	027L3580	\$4,385
ICF-SS25-6-3RA	1" BW Sch 40	027L3585	\$4,431
ICF-SS25-6-3RB	1¼" BW Sch 40	027L3587	\$4,651
ICF-SS25-6-3RB	1½" BW Sch 40	027L3588	\$5,016

* Price does not include coil. Coil must be ordered separately; see page 26 for coil ordering.

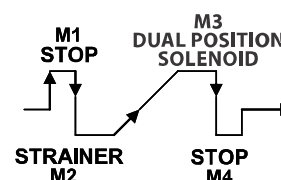


**Application #47 is typically used for:
Hot gas defrost lines to give a soft hot gas defrost**

Application #47 has the following valve functions: Stop valve, strainer, ICSH dual position solenoid, stop valve				
Type	ICS Port Size	Connection Type/Size	Part No. *	List Price *
ICF50-4-47H32	1¼"	1½" SW	027L5070	\$3,250
ICF50-4-47H40	1½"	1½" SW	027L5071	\$3,306
		2" SW	027L5072	\$3,425
ICF50-4-47H50	2"	2" SW	027L5073	\$3,644

* Price does not include coil. Coil must be ordered separately; see page 26 for coil ordering.

**Application #47 example:
ICF 50-4-47H50**

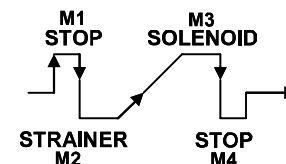


Application #9 and 10 are typically used for: Hot gas defrost lines

Application #9 has the following valve functions: Stop valve, strainer, solenoid with manual stem, stop valve			
Type	Connection Type/ Size	Part No. *	List Price *
ICF15-4-9H	½" SW	027L4527	\$1,445
ICF20-4-9H	¾" SW	027L3351	\$1,636
	1" SW	027L3336	\$1,719
ICF25-4-9	1" SW	027L4064	\$1,950
	1¼" SW	027L4069	\$2,088
	1½" SW	027L4073	\$2,321
ICF50-4-9S32	1½" SW	148X1505	\$2,744
ICF50-4-9S40	1½" SW	148X1514	\$2,801
	2" SW	148X1519	\$2,919
ICF50-4-9S50	2" SW	148X1500	\$3,139
Application #10 has the following valve functions: Stop valve, strainer, solenoid with manual stem, HEV			
Type	Connection Type/ Size	Part No. *	List Price *
ICF20-4-10HRB	¾" SW	027L3404	\$1,636
	1" SW	027L3402	\$1,719
ICF25-4-10RA	1" SW	027L4077	\$1,950
ICF25-4-10RB	1¼" SW	027L4087	\$2,088
	1½" SW	027L4091	\$2,321
ICF50-4-10S32	1½" SW	148X1524	\$2,744
ICF50-4-10S40	2" SW	148X1525	\$2,919

* Price does not include coil. Coil must be ordered separately;
see page 26 for coil ordering.

Application #9 example: ICF 25-4-9

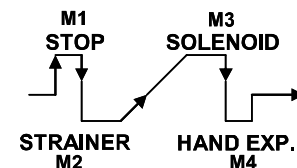


Stainless Steel ICF-SS, Application #9 and 10

Application #9 has the following valve functions: Stop valve, strainer, solenoid with manual stem, stop valve			
Type	Connection Type/ Size	Part No. *	List Price *
ICF-SS20-4-9H	¾" BW Sch 40	027L3552	\$2,863
	1" BW Sch 40	027L3553	\$3,008
ICF-SS25-4-9	1" BW Sch 40	027L3565	\$3,412
	1¼" BW Sch 40	027L3566	\$3,655
	1½" BW Sch 40	027L3567	\$4,061
Application #10 has the following valve functions: Stop valve, strainer, solenoid with manual stem, HEV			
Type	Connection Type/ Size	Part No. *	List Price *
ICF-SS20-4-10HRB	¾" BW Sch 40	027L3582	\$2,863
	1" BW Sch 40	027L3583	\$3,008
ICF-SS25-4-10RA	1" BW Sch 40	027L3592	\$3,412
ICF-SS25-4-10RB	1¼" BW Sch 40	027L3593	\$3,655
	1½" BW Sch 40	027L3594	\$4,061

* Price does not include coil. Coil must be ordered separately;
see page 26 for coil ordering.

Application #10 example: ICF 25-4-10RB

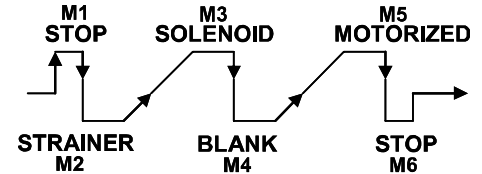


Application #5 is typically used for: Liquid make-up or direct expansion applications

Application #5 has the following valve functions: Stop valve, strainer, solenoid with manual stem, motorized ICM valve, stop valve					
Type	Connection Type/Size	Part No. *		List Price *	
		Valve w/o Motor	ICAD 600A Motor	Valve w/o Motor *	ICAD 600A Motor *
ICF20-6-5MA33	¾" SW	027L3154	027X0166	\$3,359	\$2,257
ICF20-6-5MA	¾" SW	027L3038	027X0166	\$3,359	\$2,257
ICF20-6-5MA	1" SW	027L3040	027X0166	\$3,528	\$2,257
ICF20-6-5MB66	¾" SW	027L3159	027X0166	\$3,359	\$2,257
ICF20-6-5MB66	1" SW	027L3160	027X0166	\$3,528	\$2,257
ICF20-6-5MB	¾" SW	027L3127	027X0166	\$3,359	\$2,257
ICF20-6-5MB	1" SW	027L3045	027X0166	\$3,528	\$2,257
ICF20-6-5HMB	1" SW	027L3326	027X0166	\$3,565	\$2,257
ICF20-6-5HMC	1" SW	027L3330	027X0166	\$3,565	\$2,257
ICF20-6-5HMC	1¼" SW	027L3331	027X0166	\$3,741	\$2,257
ICF25-6-5MA	1" SW	027L4039	027X0166	\$4,149	\$2,257
ICF25-6-5MA	1¼" SW	027L4044	027X0166	\$4,356	\$2,257
ICF25-6-5MA	1½" SW	027L4132	027X0166	\$4,651	\$2,257

* ICF valve and ICAD 600A motor actuator must be ordered separately when ordering.
ICAD 600A motor actuator is required for the motor valve to operate. Coil price not included.

Application #5 example: ICF 25-6-5MA



Stainless Steel ICF-SS, Application #5

Application #5 has the following valve functions: Stop valve, strainer, solenoid with manual stem, motorized ICM valve, stop valve					
Type	Connection Type/Size	Part No. *		List Price *	
		Valve w/o Motor	ICAD 600A Motor	Valve w/o Motor *	ICAD 600A Motor *
ICF-SS20-6-5MA33	¾" BW Sch 40	027L3573	027X0166	\$5,879	\$2,257
ICF-SS20-6-5MA	¾" BW Sch 40	027L3574	027X0166	\$5,879	\$2,257
ICF-SS20-6-5MA	1" BW Sch 40	027L3575	027X0166	\$6,174	\$2,257
ICF-SS20-6-5MB	¾" BW Sch 40	027L3576	027X0166	\$5,879	\$2,257
ICF-SS20-6-5MB	1" BW Sch 40	027L3577	027X0166	\$6,174	\$2,257
ICF-SS25-6-5MA	1" BW Sch 40	027L3589	027X0166	\$7,261	\$2,257
ICF-SS25-6-5MA	1¼" BW Sch 40	027L3590	027X0166	\$7,625	\$2,257
ICF-SS25-6-5MA	1½" BW Sch 40	027L3591	027X0166	\$8,142	\$2,257

* ICF valve and ICAD 600A motor actuator must be ordered separately when ordering.
ICAD 600A motor actuator is required for the motor valve to operate. Coil price not included.

Common Coils *

Voltage	Electrical Connection	Part No.	List Price
110 AC	Terminal box	018F6813	\$55
110 AC	Terminal box with GREEN pilot light	018F6816	\$100

* For other coil voltages and types, see page 26

Application #12, 13, and 90 are typically used for: Direct expansion applications with pulse width modulating valves

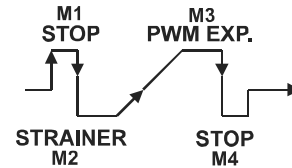
Application #12 has the following valve functions:

Stop valve, strainer, pulse expansion valve, stop valve

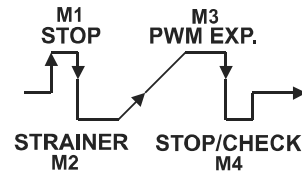
Type	Connection Type/ Size	Part No. *	List Price
ICF15-4-12	½" SW	027L4528	\$1,631
ICF20-4-12	¾" SW	027L3091	\$1,822

* Price does not include coil. Coil must be ordered separately;
see page 26 for coil ordering.

Application #12 example: ICF 20-4-12



Application #13 example: ICF 20-4-13



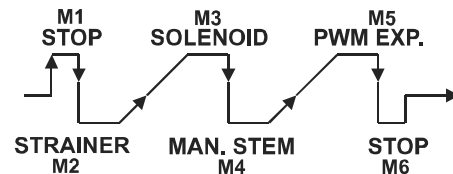
Application #13 has the following valve functions:

Stop valve, strainer, pulse expansion valve, stop/check valve

Type	Connection Type/ Size	Part No. *	List Price
ICF15-4-13	½" SW	027L4529	\$1,643
ICF20-4-13	¾" SW	027L3094	\$1,835

* Price does not include coil. Coil must be ordered separately;
see page 26 for coil ordering.

Application #90 example: ICF 20-6-90



Application #90 has the following valve functions:

Stop valve, strainer, solenoid w/man. Stem, pulse expansion valve, stop valve

Type	Connection Type/ Size	Part No. *	List Price
ICF20-6-90	¾" SW	027L3055	\$1,933

* Price does not include coil. Coil must be ordered separately;
see page 26 for coil ordering.

Application #14 is typically used for: Direct expansion applications with motorized valves

Application #14 has the following valve functions: Stop valve, strainer, motorized ICM valve, stop valve					
Type	Connection Type/Size	Part No. *		List Price *	
		Valve w/o Motor	ICAD 600A Motor	Valve w/o Motor *	ICAD 600A Motor *
ICF20-4-14MA	¾" SW	027L3099	027X0166	\$2,433	\$2,257
ICF20-4-14MB	1" SW	027L3106	027X0166	\$2,554	\$2,257
ICF20-4-14MC	1" SW	027L3112	027X0166	\$2,554	\$2,257
ICF20-4-14MC	1¼" SW	027L3113	027X0166	\$2,674	\$2,257
ICF25-4-14MA	1" SW	027L4104	027X0166	\$2,949	\$2,257
ICF25-4-14MA	1¼" SW	027L4109	027X0166	\$3,098	\$2,257
ICF25-4-14MA	1½" SW	027L4140	027X0166	\$3,309	\$2,257
ICF25-4-14MB	1¼" SW	027L4114	027X0166	\$3,098	\$2,257
ICF25-4-14MB	1½" SW	027L4118	027X0166	\$3,309	\$2,257



* ICF valve and ICAD 600A motor actuator must be ordered separately when ordering.
ICAD 600A motor actuator is required for the motor valve to operate.

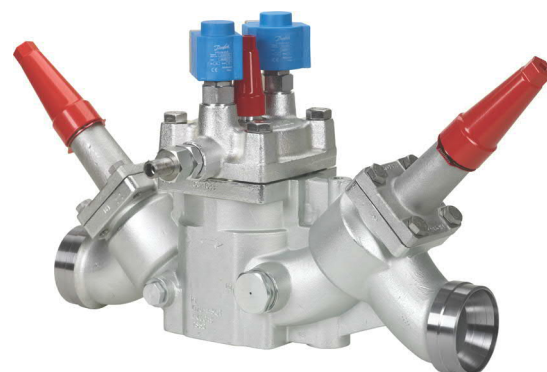
Application #18 is typically used for: Pumped liquid lines feeding 2 evaporators having separate HEVs

Application #18 has the following valve functions: Stop valve, strainer, solenoid, stop/check valve			
Type	Connection Type/Size	Part No. *	List Price *
ICF20-4-18H	¾" SW	027L3353	\$1,685
ICF20-4-18H	1" SW	027L3354	\$1,770
ICF25-4-18	1¼" SW	027L4137	\$2,130
ICF25-4-18	1½" SW	027L4138	\$2,316

* Price does not include coil. Coil must be ordered separately;
see page 26 for coil ordering.

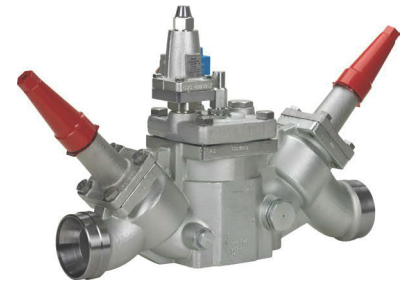
Application #41 is used for: Gas-powered suction stop valve applications

Application #41 has the following valve functions: Stop valve, gas-powered ICLX valve, stop valve (NO strainer)			
Type	Connection Type/Size	Part No. *	List Price *
ICF 50-4-41	1½" SW	027L5022	\$3,446
	2" SW	027L5024	\$3,617
ICF 65-3-41	2½" BW	027L6522	\$4,402
	3" BW	027L6524	\$4,621



* Price does not include coil. Coil must be ordered separately;
see page 26 for coil ordering.

Application #42 is used for regulator valve applications



Application #42 has the following valve functions:

Stop valve, ICS Regulator, stop valve (NO Strainer)

Type	ICS Port Size	ICS Variation ¹	Connection Type/Size	Part No. *	List Price *
ICF50-4-42S32-STD	1¼"	STD	1½" SW	148X1506	\$2,701
			2" SW	148X1510	\$2,818
ICF50-4-42S32-S	1¼"	S	1½" SW	148X1507	\$2,869
			2" SW	148X1511	\$2,988
ICF50-4-42S32-B	1¼"	B	1½" SW	148X1508	\$2,869
			2" SW	148X1512	\$2,988
ICF50-4-42S32-D	1¼"	D	1½" SW	148X1509	\$3,193
			2" SW	148X1513	\$3,311
ICF50-4-42S32-O	1¼"	O	1½" SW	148X1540	\$2,841
			2" SW	148X1542	\$2,959
ICF50-4-42S32-OS	1¼"	OS	1½" SW	148X1541	\$3,010
			2" SW	148X1543	\$3,128
ICF50-4-42S32-M	1¼"	M	1½" SW	148X1221	\$5,430
			2" SW	148X1223	\$5,549
ICF50-4-42S32-DM	1¼"	DM	1½" SW	148X1222	\$5,922
			2" SW	148X1224	\$6,040
ICF50-4-42S40-STD	1½"	STD	1½" SW	148X1515	\$2,757
			2" SW	148X1520	\$2,875
ICF50-4-42S40-S	1½"	S	1½" SW	148X1516	\$2,926
			2" SW	148X1521	\$3,045
ICF50-4-42S40-B	1½"	B	1½" SW	148X1517	\$2,926
			2" SW	148X1522	\$3,045
ICF50-4-42S40-D	1½"	D	1½" SW	148X1518	\$3,250
			2" SW	148X1523	\$3,368
ICF50-4-42S40-O	1½"	O	1½" SW	148X1544	\$2,898
			2" SW	148X1546	\$3,016
ICF50-4-42S40-OS	1½"	OS	1½" SW	148X1545	\$3,067
			2" SW	148X1547	\$3,185
ICF50-4-42S40-M	1½"	M	1½" SW	148X1225	\$5,488
			2" SW	148X1227	\$5,606
ICF50-4-42S40-DM	1½"	DM	1½" SW	148X1226	\$5,979
			2" SW	148X1228	\$6,098
ICF65-3-42S40-STD	1½"	STD	2½" BW	148X1534	\$3,491
ICF65-3-42S40-S	1½"	S	2½" BW	148X1535	\$3,660
ICF65-3-42S40-B	1½"	B	2½" BW	148X1536	\$3,660
ICF65-3-42S40-D	1½"	D	2½" BW	148X1537	\$3,983
ICF65-3-42S40-M	1½"	M	2½" BW	148X1233	\$6,221
ICF65-3-42S40-DM	1½"	DM	2½" BW	148X1234	\$6,714
ICF50-4-42S50-STD	2"	STD	2" SW	148X1501	\$3,095
ICF50-4-42S50-S	2"	S	2" SW	148X1502	\$3,264
ICF50-4-42S50-B	2"	B	2" SW	148X1503	\$3,264
ICF50-4-42S50-D	2"	D	2" SW	148X1504	\$3,587
ICF50-4-42S50-O	2"	O	2" SW	148X1538	\$3,236
ICF50-4-42S50-OS	2"	OS	2" SW	148X1539	\$3,405
ICF50-4-42S50-M	2"	M	2" SW	148X1219	\$5,825
ICF50-4-42S50-DM	2"	DM	2" SW	148X1220	\$6,317
ICF65-3-42S65-STD	2½"	STD	2½" BW	148X1526	\$3,844
			3" BW	148X1530	\$4,021
ICF65-3-42S65-S	2½"	S	2½" BW	148X1527	\$4,013
			3" BW	148X1531	\$4,190
ICF65-3-42S65-B	2½"	B	2½" BW	148X1528	\$4,013
			3" BW	148X1532	\$4,190
ICF65-3-42S65-D	2½"	D	2½" BW	148X1529	\$4,336
			3" BW	148X1533	\$4,513
ICF65-3-42S65-M	2½"	M	2½" BW	148X1229	\$6,574
			3" BW	148X1231	\$6,751
ICF65-3-42S65-DM	2½"	DM	2½" BW	148X1230	\$7,066
			3" BW	148X1232	\$7,243

* Price does not include coil. Coil must be ordered separately; see page 26 for coil ordering. For M and DM variations the price does include the ICAD 1200A motor.

¹ See p.20 for a description of the regulator variations.

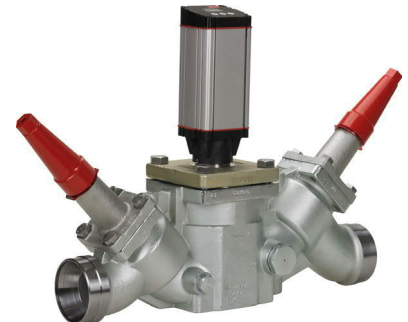
Application #43 is typically used for: Motorized regulating valve applications

Application #43 has the following valve functions:

Stop valve, motorized ICM valve, stop valve (NO strainer)

Type	Connection Type/Size	Part No.		List Price *	
		Valve w/o Motor	ICAD 1200A Motor	Valve w/o Motor *	ICAD 1200A Motor *
ICF 50-4-43MB	1½" SW	027L5018	027X0168	\$3,439	\$2,564
ICF 50-4-43MB	2" SW	027L5020	027X0168	\$3,920	\$2,564
ICF 65-3-43MB	2½" BW	027L6518	027X0168	\$5,658	\$2,564
ICF 65-3-43MB	3" BW	027L6520	027X0168	\$6,167	\$2,564

* ICF valve and ICAD 1200A motor actuator must be ordered separately when ordering. ICAD 1200A motor actuator is required for the motor valve to operate. Coil price not included.



Application #106 and #107 are typically used in defrost condensate return lines as a float drain

Application #106 has the following valve functions:

Stop valve, ICFD defrost float drain, solenoid, manual stem for solenoid

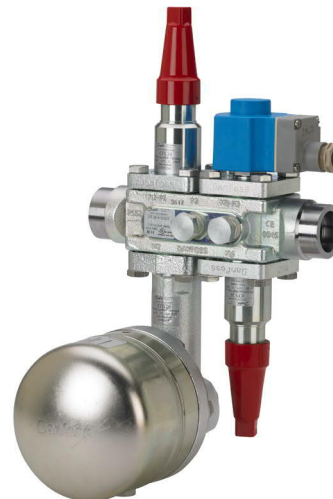
Type	Connection Type/Size	Part No. *	List Price *
ICF20-4-106	¾" SW	027L3551	\$1,996
ICF20-4-106	1" SW	027L3496	\$2,075

Application #107 has the following valve functions:

Stop valve, ICFD defrost float drain, solenoid, manual stem for solenoid and ending stop valve

Type	Connection Type/Size	Part No. *	List Price *
ICF20-6-107	¾" SW	027L3498	\$2,254
ICF20-6-107	1" SW	027L3499	\$2,332

* Price does not include coil. Coil must be ordered separately; see page 26 for coil ordering.



Application #108 is typically used for a drain on a reheat coil*

Application #108 has the following valve functions:

Stop valve, ICFD defrost float drain, stop valve

Type	Connection Type/Size	Part No. *	List Price *
ICF20-4-108	¾" SW	027L3558	\$2,092
ICF20-4-108	1" SW	027L3559	\$2,170

* ICF application#108 should **NOT** be used as a defrost condensate drain or as a high side float.

Purge valve and adapter for ICFD float train module

Description	Part No.	List Price
Purge valve SNV-ST, ¾" FPT x FPT and adapter for ICFD float drain module	148B6607	\$79

SVA - Threaded Shut-off Valves FPT ½ in. – 1 in.

Cold-resistant steel, no ductile iron used

TYPE SVA-S

STANDARD VALVES

Application #14 has the following valve functions: Stop valve, strainer, motorized ICM valve, stop valve						
Size		Part No.				List Price
		Angle		Globe		
Inches	(mm)	Handwheel	Seal Cap	Handwheel	Seal Cap	
½"	(15)	148B5224	148B5225	148B5234	148B5235	\$144
¾"	(20)	148B5324	148B5325	148B5334	148B5335	\$155
1"	(25)	148B5424	148B5425	148B5434	148B5435	\$175

TYPE SVA-L

LONG NECK (EXTENDED BONNET)

Application #14 has the following valve functions: Stop valve, strainer, motorized ICM valve, stop valve						
Size		Part No.				List Price
		Angle		Globe		
Inches	(mm)	Handwheel	Seal Cap	Handwheel	Seal Cap	
½"	(15)	148B5264	148B5265	148B5274	148B5275	\$194
¾"	(20)	148B5364	148B5365	148B5374	148B5375	\$209
1"	(25)	148B5464	148B5465	148B5474	148B5475	\$242

Contact Danfoss for 1¼" FPT

Stop Valves (SVA)

- ANSI connections
- FPT: ½ in. to 1¼ in., SW: ½ in. to 2 in., BW ½ in. to 12 in.
- SVA-S and SVA-L are all 754 psig rated
- Temperature range: -76 °F to 302 °F
- Seal cap or handwheel, angle or globe
- Perfect closing valve cone
- Great flow characteristics
- Polished stainless steel spindle
- Scraper designed to prevent penetration of dirt/ice into packing gland
- Cold-resistant steel design - no ductile iron valve bodies

Shut-off Valves

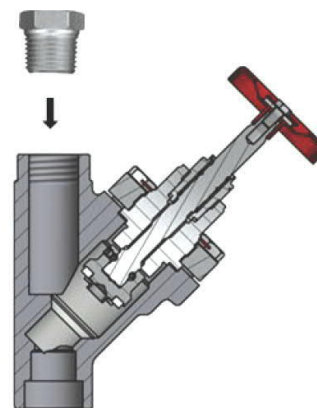
Description	Connection size (in.) and type		Part No.	List Price
	Inlet	Outlet		
SVA 15 globe shut-off valve with handwheel	½" SW	½" male NPT	148B5268	\$156
SVA 15 globe shut-off valve with seal cap	½" SW	½" male NPT	148B5267	\$156
SVA-S 20 angle shut-off valve with handwheel	¾" SW	¾" FPT	148B6789	\$164
SVA-S 20 angle shut-off valve with seal cap	¾" SW	¾" FPT	148B6790	\$164
SVA-S 20 globe shut-off valve with handwheel	¾" SW	¾" FPT	148B6791	\$164
SVA-S 20 globe shut-off valve with seal cap	¾" SW	¾" FPT	148B6792	\$164

Can be used as vent/drain valve with threaded plug or cap (not included).

FPT Threaded



Stainless steel trim is **standard** on all stop valves and hand expansion valves.



SVA - Socket-Weld Shut-off Valves SOC ½ in. – 2 in.

TYPE SVA-S

STANDARD VALVES

Size		Part No.				List Price
		Angle		Globe		
Inches	(mm)	Handwheel	Seal Cap	Handwheel	Seal Cap	
½"	(15)	148B5222	148B5223	148B5232	148B5233	\$144
¾"	(20)	148B5322	148B5323	148B5332	148B5333	\$155
1"	(25)	148B5422	148B5423	148B5432	148B5433	\$175
1¼"	(32)	148B5522	148B5523	148B5532	148B5533	\$232
1½"	(40)	148B5622	148B5623	148B5632	148B5633	\$325
2"	(50)	148B5722	148B5723	148B5732	148B5733	\$401

Socket Weld



TYPE SVA-L

LONG NECK (EXTENDED BONNET)

Size		Part No.				List Price
		Angle		Globe		
Inches	(mm)	Handwheel	Seal Cap	Handwheel	Seal Cap	
½"	(15)	148B5262	148B5263	148B5272	148B5273	\$194
¾"	(20)	148B5362	148B5363	148B5372	148B5373	\$209
1"	(25)	148B5462	148B5463	148B5472	148B5473	\$242
1¼"	(32)	148B5562	148B5563	148B5572	148B5573	\$298
1½"	(40)	148B5662	148B5663	148B5672	148B5673	\$409



Stop Valves (SVA)

- ANSI connections
- FPT: ½ in. to 1¼ in., SW: ½ in. to 2 in., BW ½ in. to 12 in.
- SVA-S and SVA-L are all 754 psig rated
- Temperature range: -76 °F to 302 °F
- Seal cap or handwheel, angle or globe
- Perfect closing valve cone
- Great flow characteristics
- Polished stainless steel spindle
- Scraper designed to prevent penetration of dirt/ice into packing gland
- Cold-resistant steel design - no ductile iron valve bodies

Sizes 2" and up
are standard with
a long neck
(extended
bonnet)

SVA - Butt-Weld Shut-off Valves BW ½ in. – 8 in. (10 in. to 12 in.)

TYPE SVA-S

STANDARD VALVES

Size		Part No.				List Price	
		Angle		Globe			
Inches	(mm)	Handwheel	Seal Cap	Handwheel	Seal Cap	Angle	Globe
½"	(15)	148B5220	148B5221	148B5230	148B5231	\$152	
¾"	(20)	148B5320	148B5321	148B5330	148B5331	\$164	
1"	(25)	148B5420	148B5421	148B5430	148B5431	\$187	
1¼"	(32)	148B5520	148B5521	148B5530	148B5531	\$245	
1½"	(40)	148B5620	148B5621	148B5630	148B5631	\$342	
2"	(50)	148B5720	148B5721	148B5730	148B5731	\$414	
2½"	(65)	148B5820	148B5821	148B5830	148B5831	\$540	
3"	(80)	148B5920	148B5921	148B5930	148B5931	\$767	
4"	(100)	148B6020	148B6021	148B6030	148B6031	\$1,031	
5"	(125)	148B6120	148B6121	148B6130	148B6131	\$1,665	\$1,818
6"	(150)	148B6220	148B6221	148B6230	148B6231	\$1,964	\$2,205
8"	(200)	148B6320	148B6321	148B6330	148B6331	\$4,338	\$4,744

Butt Weld



Stainless steel trim is **standard** on all stop valves and hand expansion valves.

TYPE SVA-L

LONG NECK (EXTENDED BONNET)

Size		Part No.				List Price
		Angle		Globe		
Inches	(mm)	Handwheel	Seal Cap	Handwheel	Seal Cap	
½"	(15)	148B5260	148B5261	148B5270	148B5271	\$208
¾"	(20)	148B5360	148B5361	148B5370	148B5371	\$218
1"	(25)	148B5460	148B5461	148B5470	148B5471	\$255
1¼"	(32)	148B5560	148B5561	148B5570	148B5571	\$311
1½"	(40)	148B5660	148B5661	148B5670	148B5671	\$436



Seal Cap Lockout Ring

Part No.	List Price
148B6707	\$95



SVA-DH - Butt-Weld Shut-off Valves BW 10 in. –12 in.

ANGLE

Size		Part No.		List Price
Inches	(mm)	Handwheel	Seal Cap	
10"	(250)	148B3767	148B3766	\$9,245
12"	(300)	148B3777	148B3776	\$13,771



Features

- No restriction in flow direction
- Internal equalization makes it easy to open under high (580 psi) Δp conditions on either side
- Designed to give favorable flow conditions
- Internal backseating enables replacement of the spindle seal while the valve is active, i.e. under pressure
- Max. operating pressure: 580 psig (40 bar g)
- Temperature range: SVA-DH: -76/+302 °F (-60/+150 °C)
- SVA-DH is equipped with an extended bonnet/spindle for installation in insulated systems

SVA-S SS - Stainless Steel Shut-off Valves

Size		Connection Type	Part No.		List Price	
Inches	(mm)		Angle Seal Cap	Globe Seal Cap	Angle	Globe
½"	(15)	ANSI Sch 40 BW	148B5396	148B5397	\$251	
¾"	(20)	ANSI Sch 40 BW	148B5395	148B5398	\$271	
1"	(25)	ANSI Sch 40 BW	148B6477	148B5399	\$307	
1¼"	(32)	ANSI Sch 40 BW	148B5595	148B5596	\$405	
1½"	(40)	ANSI Sch 40 BW	148B5683	148B5684	\$569	
2"	(50)	ANSI Sch 10 BW	148B5754	148B5756	\$702	
2½"	(65)	ANSI Sch 10 BW	148B6448	148B6449	\$942	
3"	(80)	ANSI Sch 10 BW	148B5928	-	\$1,343	-
4"	(100)	ANSI Sch 10 BW	148B6035	-	\$1,804	-
5"	(125)	DIN (European) BW	148B6126	-	\$2,913	-



SCA-X - Stop Check Valves

Size		Connection Type	Part No.		List Price
Inches	(mm)		Angle	Globe	
½"	(15)	Butt weld	148B5209	148X1352	\$403
¾"	(20)	Butt weld	148B5309	148X1353	\$419
1"	(25)	Butt weld	148B5409	148X1354	\$492
1¼"	(32)	Butt weld	148B5509	148X1355	\$525
1½"	(40)	Butt weld	148B5609	148X1356	\$567
2"	(50)	Socket weld	148B5704	—	\$809
2"	(50)	Butt weld	148B5703	148X1357	\$821
2½"	(65)	Butt weld	148B5802	148X1358	\$1,120
3"	(80)	Butt weld	148B5903	148X1359	\$1,423
4"	(100)	Butt weld	148B6004	148X1360	\$1,887
5"	(125)	Butt weld	148B6103	148X1361	\$2,852

* For other sizes and options, contact Danfoss.



Stainless Steel SCA-X SS - Angle Stop Check Valves

Size		Connection Type	Part No.	List Price
Inches	(mm)			
½"	(15)	DIN Butt weld	148B5293	\$705
¾"	(20)	ANSI Sch 40 Butt weld	148B6489	\$734
1"	(25)	ANSI Sch 40 Butt weld	148B6480	\$861
1¼"	(32)	ANSI Sch 40 Butt weld	148B6490	\$921
1½"	(40)	ANSI Sch 40 Butt weld	148B5687	\$991

Features

- 754 psig rated
- -76 °F to 302 °F
- Stainless steel bolts
- Laser cut V-ports for excellent opening characteristics even with low flow.
- Non-chattering design with built-in damping chamber
- Opens at low differential pressure of 0.58 psi
- Stronger spring available for an opening differential pressure of 4.35 psi.

CHV-X - Piston Type Check Valves

Size *		Connection Type	Part No.		List Price	
Inches	(mm)		Angle	Globe	Angle	Globe
½"	(15)	Socket weld	-	148B6601	\$239	
		Butt weld	148B5237	148B6582	\$246	
¾"	(20)	Socket weld	-	148B6602	\$252	
		Butt weld	148B5337	148B6584	\$262	
1"	(25)	Socket weld	-	148B6603	\$277	
		Butt weld	148B5437	148B6586	\$290	
1¼"	(32)	Socket weld	148B5539	148B6604	\$290	
		Butt weld	148B5537	148B6588	\$302	
1½"	(40)	Socket weld	-	148B6605	\$360	
		Butt weld	148B5637	148B6590	\$378	
2"	(50)	Socket weld	148B5740	148B6606	\$485	
		Butt weld	148B5737	148B6592	\$497	
2½"	(65)	Butt weld	148B5837	148B6594	\$733	
3"	(80)	Butt weld	148B5937	148B6596	\$882	
4"	(100)	Butt weld	148B6037	148X1021	\$1,391	
5"	(125)	Butt weld	148B6137	148X1022	\$2,533	\$2,687

* For other sizes and options, contact Danfoss.



CHV-X

CHV Features

- 754 psig rated
- -76 °F to 302 °F
- Laser cut V-ports for excellent opening characteristics
- Non-chattering design with built-in damping chamber
- Opens at low differential pressure of 0.58 psi.
- Stainless steel bolts
- Stronger spring available for an opening differential pressure of 4.35 psi.

Stainless Steel CHV-X SS - Globe Check Valves

Size		Connection Type	Code No.	List Price
Inches	(mm)		Globe	
¾"	(20)	ANSI Sch 40 Butt weld	148B6608	\$456
1"	(25)	ANSI Sch 40 Butt weld	148B6609	\$487
1¼"	(32)	ANSI Sch 40 Butt weld	148B6610	\$505
1½"	(40)	ANSI Sch 40 Butt weld	148B6611	\$630

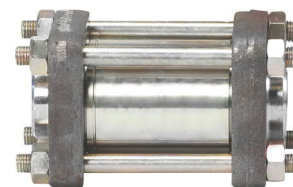


CHV-X SS

NRVA - Piston Type In-Line Check Valves

Size		Valve Type	Flange Type *	Code No.	List Price
Inches	(mm)				
½"	(15)	NRVA 15	¾" FPT	027X0262	\$188
½"	(15)	NRVA 15	¾" SOC	027X0325	\$188
½"	(15)	NRVA 15	½" FPT	027X0181	\$188
½"	(15)	NRVA 15	½" SOC	027X0182	\$188
½"	(15)	NRVA 15	½" WN	027X0253	\$188
¾"	(20)	NRVA 20	¾" SOC	027X0183	\$207
¾"	(20)	NRVA 20	¾" WN	027X0247	\$207
1"	(25)	NRVA 25	1" SOC	027X0184	\$295
1"	(25)	NRVA 25	1" WN	027X0246	\$295
1¼"	(32)	NRVA 32	1¼" SOC	027X0185	\$320
1¼"	(32)	NRVA 32	1¼" WN	027X0252	\$320
1½"	(40)	NRVA 40	1½" SOC	027X0188	\$470
1½"	(40)	NRVA 40	1½" WN	027X0251	\$470
2"	(50)	NRVA 50	2" SOC	027X0189	\$503
2"	(50)	NRVA 50	2" WN	027X0190	\$503
2½"	(65)	NRVA 65	2½" WN	027X0191	\$754

* Contact Danfoss for solder connection options.



Features

- Suitable for pulsing discharge lines such as in reciprocating compressors
- Teflon (PTFE) seat for excellent sealing with minimum closing forces
- Can be used in liquid, suction and hot gas line
- 580 psig rated
- Temperature range: -58 °F to 284 °F
- No orientation limitations

REG-S - Hand Regulating/Expansion Valves

Size		Cone Size	Connection Type	Part No.		List Price
Inches	(mm)			Angle	Globe	
3/8"	(10)	B	Butt weld	148B5107	148B5117	\$177
1/2"	(15)	A	FPT	148B5206	148B5216	\$165
		A	Socket weld	148B5204	148B5214	\$165
		A	Butt weld	148B5202	148B5212	\$177
3/4"	(20)	B	FPT	148B5307	148B5317	\$183
		B	Socket weld	148B5305	148B5315	\$183
		B	Butt weld	148B5303	148B5313	\$192
1"	(25)	A	FPT	148B5406	148B5416	\$219
		A	Socket weld	148B5404	148B5414	\$219
		A	Butt weld	148B5402	148B5412	\$230
1 1/4"	(32)	A	Socket weld	148B5504	148B5514	\$274
		A	Butt weld	148B5502	148B5512	\$288
1 1/2"	(40)	B	Socket weld	148B5605	148B5615	\$404
		B	Butt weld	148B5603	148B5613	\$420
2"	(50)	B	Socket weld	148B5727	148B5725	\$468
		B	Butt weld	148B5706	148B5724	\$480
2 1/2"	(65)	B	Butt weld	148B5806	148B5809	\$761



REG-L - Long Neck Hand Regulating/Expansion Valves

Size		Cone Size	Connection Type	Part No.		List Price
Inches	(mm)			Angle	Globe	
1/2"	(15)	A	Socket weld	-	148X0503	\$233
3/4"	(20)	B	Socket weld	-	148X0507	\$235
1"	(25)	A	Socket weld	-	148X0505	\$365
1 1/4"	(32)	A	Socket weld	148X0765	148X0506	\$369
1 1/2"	(40)	B	Socket weld	-	148X0504	\$388

Stainless Steel REG-S SS - Hand Regulating/Expansion Valves

Size		Cone Size	Connection Type	Part No.		List Price
Inches	(mm)			Angle	Globe	
1/2"	(15)	A	ANSI Sch 40 Butt weld	148B6482	148B5299	\$291
3/4"	(20)	B	ANSI Sch 40 Butt weld	148B6487	148B6488	\$320
1"	(25)	A	ANSI Sch 40 Butt weld	148B6483	148B6485	\$385
1 1/4"	(32)	A	ANSI Sch 40 Butt weld	148B6484	148B6486	\$481
1 1/2"	(40)	B	ANSI Sch 40 Butt weld	148B5686	148B5685	\$707

ICS - Pressure Regulating Valve with Direct Weld Body (Steel Body)

Valve Size	Nominal Port Size		Flow Coefficient		Connection Type and Size			
	Inches	(mm)	Cv	(Kv)	FPT	SW	BW	ODS
ICS 25-5	3/16"	(5)	2	(1.7)	3/4", 1"	3/4", 1"	3/4", 1", 1 1/4"	7/8", 1 1/8", 1 3/8"
ICS 25-10	3/8"	(10)	4.1	(3.5)	3/4", 1"	3/4", 1"	3/4", 1", 1 1/4"	7/8", 1 1/8", 1 3/8"
ICS 25-15	5/8"	(15)	7	(6.0)	3/4", 1"	3/4", 1"	3/4", 1", 1 1/4"	7/8", 1 1/8", 1 3/8"
ICS 25-20	3/4"	(20)	9.3	(8.0)	3/4", 1"	3/4", 1"	3/4", 1", 1 1/4"	7/8", 1 1/8", 1 3/8"
ICS 25-25	1"	(25)	13.3	(11.5)	1"	1"	1", 1 1/4"	7/8", 1 1/8", 1 3/8"
ICS 32	1 1/4"	(32)	20	(17)	-	1 1/4"	1 1/4", 1 1/2"	1 3/8", 1 5/8"
ICS 40	1 1/2"	(40)	31	(27)	-	1 1/2"	1 1/2", 2"	1 5/8"
ICS 50	2"	(50)	51	(44)	-	2"	2", 2 1/2"	2 1/8"
ICS 65	2 1/2"	(65)	81	(70)	-	2 1/2"	2 1/2", 3"	2 5/8"
ICS 80	3"	(80)	98	(85)	-	-	3"	-
ICS 100	4"	(100)	165	(142)	-	-	4"	-
ICS 125	5"	(125)	240	(207)	-	-	5"	-
ICS 150	6"	(150)	410	(354)	-	-	6"	-



ICS Features:

- Direct-weld connections to eliminate leak potential
- Serviceable function module with V-port design
- ICS is one-third the weight and half the size of traditional cast iron valves with flanges (less costly to ship and takes up less space)
- Complete overhaul by replacing the one-piece function module containing the only wear surfaces
- Low temperature steel body, media range: -76 °F to +248 °F
- Stainless steel bolts
- 754 psig rated



Standard Regulator Variations

Suffix	Function
STD	Inlet pressure regulation - Standard with CVP-L pilot range 20 in.HG to 102 psig.
"O"	Outlet pressure regulation - Standard with CVC-L pilot range 20 in.HG to 102 psig and does NOT include an external pilot mounting set (pressure reference tubing and connection in valve).
"M" ¹	Electronically controlled pressure regulation with CVE-L pilot range 20 in.HG to 116 psig and ICAD 1200A motor.
"L"	Differential pressure regulation - Standard with CVPP-L pilot range 0 to 102 psi and does NOT include an external pilot mounting set (pressure reference tubing and connection in valve).
"S"	Inlet pressure regulation with electric shut-off - Standard with CVP-L pilot range 20 in.HG to 102 psig and EVM(NC) pilot.
"B"	Inlet pressure regulation with electric wide-opening - Standard with CVP-L pilot range 20 in.HG to 102 psig and EVM(NC) pilot.
"D"	Dual inlet pressure regulation with changeover between two preset evaporating pressures - Standard with two CVP-L pilots range 20 in.HG to 102 psig and EVM(NC) pilot.
"OS"	Outlet pressure regulation combined with electric shut-off - Standard with CVC-L pilot range 20 in.HG to 102 psig and EVM(NC) pilot and does NOT include an external pilot mounting set (pressure reference tubing and connection in valve).
"BL"	Differential pressure regulation combined with electric wide-opening - Standard with CVPP-L pilot range 0 to 102 psi and EVM(NC) pilot and does NOT include external pilot mounting set (pressure reference tubing and connection in valve).
"DM" ¹	Electronically controlled regulation combined with forced changeover to constant pressure regulation - Standard with CVE-L pilot range 20 in.HG to 116 psig, ICAD 1200A motor, EVM(NC) pilot and CVP-L pilot range 20 in.HG to 102 psig.

¹ Requires EKC 361 Electronic Controller and AKS Temperature Sensor or customer supplied PLC with 4-20mA output to control it.
See electronic controller section for pricing.

Steps for ordering:

- Step 1: Specify regulator type and size; valve prices are on the following page.
- Step 2: Specify regulator variation; consult Danfoss for variations not listed.
- Step 3: Specify connection size and type.
- Step 4: Specify coil voltage and accessories where applicable.

Example for ordering: Dual inlet pressure regulator type ICS with ¾ in. Port size, 1 in. SW connections, 120V coil and gauge valve with adapter for fitting into regulator.

Item 1: ICS 25-20-D with 1 in. SW and 120V coil

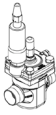
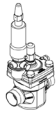
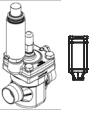

Item 2: ¼ in. gauge valve with adapter, p/n 148B4772 (selected from ICS accessories)

Note: Standard pilot ranges/coil versions will be supplied unless other pilot ranges/coil versions are specified. See pilot valve ordering section for available pressure ranges.

SOLENOID COIL(S) MUST BE ORDERED SEPARATELY; SEE PAGE 26 FOR COIL ORDERING.


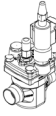
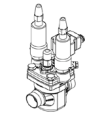
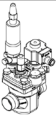

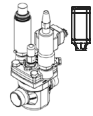
OTHER REGULATOR VARIATIONS AND ASSEMBLED VALVES ARE AVAILABLE. CONSULT DANFOSS FOR ASSISTANCE.

Single Pilot Variations

Valve Size	Module Port Size		List Prices			
						
	Inches	(mm)	"STD"	"O" ²	"M" ³	"L"
ICS 25-5	3/16"	(5)	\$634	\$775	\$3,365	\$696
ICS 25-10	3/8"	(10)	\$634	\$775	\$3,365	\$696
ICS 25-15	5/8"	(15)	\$634	\$775	\$3,365	\$696
ICS 25-20	3/4"	(20)	\$634	\$775	\$3,365	\$696
ICS 25-25	1"	(25)	\$700	\$840	\$3,430	\$761
ICS 32	1 1/4"	(32)	\$865	\$1,005	\$3,595	\$926
ICS 40	1 1/2"	(40)	\$1,208	\$1,348	\$3,938	\$1,269
ICS 50	2"	(50)	\$1,351	\$1,492	\$4,081	\$1,413
ICS 65	2 1/2"	(65)	\$1,726	\$1,866	\$4,456	\$1,787
ICS 80	3"	(65)	\$1,998	\$2,139	\$4,728	\$2,060
ICS 100	4"	(100)	\$3,541	\$3,681	\$6,271	\$3,602
ICS 125	5"	(125)	\$5,514	\$5,654	\$8,244	\$5,575
ICS 150	6"	(150)	\$9,535	\$9,675	\$12,265	\$9,596

Direct Weld Body

Multiple Pilot Variations

Valve Size	Module Port Size		List Prices Less Coil ¹					
								
	Inches	(mm)	"S"	"B"	"D"	"OS" ²	"BL"	"DM" ³
ICS 25-5	3/16"	(5)	\$962	\$962	\$1,285	\$1,102	\$1,023	\$4,015
ICS 25-10	3/8"	(10)	\$962	\$962	\$1,285	\$1,102	\$1,023	\$4,015
ICS 25-15	5/8"	(15)	\$962	\$962	\$1,285	\$1,102	\$1,023	\$4,015
ICS 25-20	3/4"	(20)	\$962	\$962	\$1,285	\$1,102	\$1,023	\$4,015
ICS 25-25	1"	(25)	\$1,027	\$1,027	\$1,350	\$1,168	\$1,088	\$4,080
ICS 32	1 1/4"	(32)	\$1,221	\$1,221	\$1,544	\$1,362	\$1,283	\$4,275
ICS 40	1 1/2"	(40)	\$1,548	\$1,548	\$1,871	\$1,688	\$1,609	\$4,601
ICS 50	2"	(50)	\$1,732	\$1,732	\$2,055	\$1,873	\$1,794	\$4,785
ICS 65	2 1/2"	(65)	\$2,128	\$2,128	\$2,451	\$2,269	\$2,190	\$5,181
ICS 80	3"	(80)	\$2,401	\$2,401	\$2,724	\$2,541	\$2,462	\$5,454
ICS 100	4"	(100)	\$3,710	\$3,710	\$4,033	\$3,850	\$3,771	\$6,763
ICS 125	5"	(125)	\$5,683	\$5,683	\$6,006	\$5,823	\$5,744	\$8,736
ICS 150	6"	(150)	\$9,704	\$9,704	\$10,027	\$9,844	\$9,765	\$12,757

¹ Price does not include coil. Coil must be ordered separately; see page 26 for coil ordering.

² Outlet pressure regulators type ICS ("O" and "OS" versions) do not include external pilot mounting set with tubing and fittings.

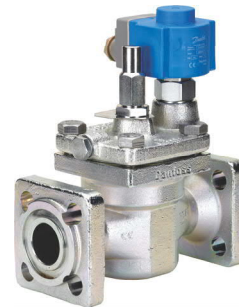
³ Includes required ICAD 1200A motor. Requires EKC 361 Electronic Controller and AKS Temperature Sensor or customer supplied PLC with 4-20mA output to control it. See electronic controller section for pricing.

WHEN ORDERING PLEASE SPECIFY VALVE TYPE, VARIATION, NOMINAL PORT SIZE, FLANGE TYPE AND SIZE.

OTHER REGULATOR VARIATIONS AND ASSEMBLED VALVES ARE AVAILABLE. CONSULT DANFOSS FOR ASSISTANCE.

Flanged ICS Solenoids to replace S4A and HS4A Solenoids

Valve Size	Module Port Size		Solenoid	
	Inches	(mm)	Part No.	List Price Less Coil ¹
ICS 20 (H)S4A ¾"	¾"	(20)	148X0866	\$480
ICS 25 (H)S4A 1"	1"	(25)	148X0853	\$546
ICS 32 S4A 1¼"	1¼"	(32)	148X0854	\$711
ICS 32 HS4A 1¼"	1¼"	(32)	148X0855	\$711
ICS 40 (H)S4A 1½"	1½"	(40)	148X0856	\$1,054
ICS 50 (H)S4A 2"	2"	(50)	148X0857	\$1,197
ICS 65 (H)S4A 2½"	2½"	(65)	148X0858	\$1,572



Flanged ICS Regulators to replace A4A and HA4A Regulators

Valve Size	Module Port Size	Regulator Variation							
		"STD"		"S" ¹		"B" ¹		"D" ¹	
	Inches	Part No.	List Price	Part No.	List Price	Part No.	List Price	Part No.	List Price
ICS 20 (H)A4A ¾"	¾"	148X0860	\$634	148X0966	\$962	148X0973	\$962	148X0980	\$1,285
ICS 25 (H)A4A 1"	1"	148X0847	\$700	148X0967	\$1,027	148X0974	\$1,027	148X0981	\$1,350
ICS 32 A4A 1¼"	1¼"	148X0848	\$865	148X0968	\$1,221	148X0975	\$1,221	148X0982	\$1,544
ICS 32 HA4A 1¼"	1¼"	148X0849	\$865	148X0969	\$1,221	148X0976	\$1,221	148X0983	\$1,544
ICS 40 (H)A4A 1½"	1½"	148X0850	\$1,208	148X0970	\$1,547	148X0977	\$1,547	148X0984	\$1,871
ICS 50 (H)A4A 2"	2"	148X0851	\$1,352	148X0971	\$1,732	148X0978	\$1,732	148X0985	\$2,055
ICS 65 (H)A4A 2½"	2½"	148X0852	\$1,726	148X0972	\$2,129	148X0979	\$2,129	148X0986	\$2,451

¹ Price does not include coil. Coil must be ordered separately; see page 26 for coil ordering.

1. Remove:
Remove the old (H)A4A or (H)S4A valve, leaving flanges in place

2. Drop in
Install the new flanged ICS valve body to the existing flanges – no need for additional modification

3. Customize
Fit the ICM motor valve insert, the ICS servo valve insert or the ICLX two-step servo valve insert.

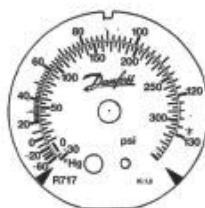
Pilots and Accessories for type ICS and PM Pressure Regulators

	Type	Description	Range	MWP psig	Part No.	List Price
	CVP-L	Pilot Valve, Inlet Pressure	20 in.HG to 102 psig	754	027B0920	\$323
	CVP-M		58 to 406 psig	754	027B0921	\$323
	CVP-H		363 to 754 psig	754	027B0922	\$775
	CVC-L	Pilot Valve, Outlet Pressure	20 in.HG to 102 psig	754	027B0940	\$446
	CVC-M		58 to 406 psig	754	027B0941	\$446
	CVPP-L	Pilot Valve, Differential Pressure	0 to 102 psi	754	027B0930	\$366
	CVPP-M		58 to 406 psi	754	027B0931	\$493
	CVE-L	Pilot Valve, Motorized (requires ICAD 1200A ordered separately)	20 in.HG to 116 psig	754	027B0980	\$489
	EVM (NC)	Pilot Valve, Solenoid (Normally Closed) Does Not Include Coil	-	754	027B1120	\$169
	EVM (NO)	Pilot Valve, Solenoid (Normally Open) Does Not Include Coil	-	754	027B1130	\$251
	-	Pilot Blanking Plug for ICS or PM	-	-	027F1046	\$35
	-	External Pilot Connector for ICS 5 to 65	¼" FPT	-	027B2065	\$81
		External Pilot Connector for ICS 80 to 125	¼" FPT	-	027B2066	\$95
	-	Pressure Gauge Connection Adapter for ICS/PM Regulators or CVC pilot	¼" FPT	-	027B2062	\$18
	-	Pressure Gauge Connection Adapter and SNV-ST ¼" MPT x ¼" FPT gauge valve	¼" FPT	-	148B4772	\$70

REMOTE PILOT MOUNTING AVAILABLE. CONSULT DANFOSS FOR ASSISTANCE.

2½ in. Ammonia Pressure Gauges

Pressure Range	Part No.	List Price
30" to 150 psig	027G9990	\$103
30" to 300 psig	027G9991	\$103



Features

- Stainless steel body
- Liquid filled design to prevent flutter
- ¼ in. male NPT bottom connection
- 2½ in. face which displays both pressure and saturation temperature

SNV-ST - Gauge, Purge, and Needle Valves

ANGLE FLOW WITH SEAL CAP

Connection size and type		Type	Single Pack		Bulk Pack *	
Bottom	Side		Part No.	List Price Each	Part No. *	List Price Each *
1/4" MPT	1/4" FPT	SNV-ST 1/4" FPT - 1/4" MPT	148B3746	\$63	148B4180	\$58
1/4" MPT	1/4" FPT	SNV-ST LONG NECK (3.95")	148B4567	\$77	148B4232	\$68
3/8" MPT	3/8" FPT	SNV-ST 3/8" FPT - 3/8" MPT	148B3747	\$70	148B4181	\$63
1/2" MPT	3/8" FPT	SNV-ST 3/8" FPT - 1/2" MPT	148B4565	\$81	148B4233	\$72
1/2" MPT	1/2" MPT	SNV-ST 1/2" MPT - 1/2" MPT	148B4564	\$81	148B4224	\$72
1/4" FPT	1/4" FPT	SNV-ST 1 1/4" FPT - 1/4" FPT	148B4568	\$63	148B4223	\$58
3/8" FPT	3/8" FPT	SNV-ST 3/8" FPT - 3/8" FPT	148B4572	\$80	148B4225	\$70
1/4" MPT	1/4" Flare	SNV-ST 1/4" Flare - 1/4" MPT	148B4566	\$88	148B4230	\$80

* Receive an additional discount when purchasing the bulk pack part no. The bulk pack part number must be purchased in multiples of 30 pcs. at any given time except for the long neck p/n 148B4232 which must be purchased in multiples of 20 pcs. Example: When ordering 30 pcs., 60 pcs., 90 pcs., etc. of the bulk pack p/n, you will receive 30 pcs. in a box with 1 set of instructions. Each SNV-ST will not be individually boxed.

Stainless Steel SNV-SS - Gauge, Purge, and Needle Valves

ANGLE FLOW WITH SEAL CAP

Connection size and type		Type	Single Pack	
Bottom	Side		Part No.	List Price Each
1/4" MPT	1/4" FPT	Stainless Steel SNV-SS 1/4" FPT - 1/4" MPT	148B4771	\$110
3/8" MPT	3/8" FPT	Stainless Steel SNV-SS 3/8" FPT - 3/8" MPT	148B3750	\$120



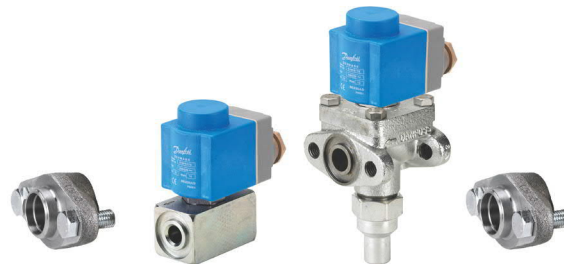
Features

- Cold resistant steel with zinc chromate coating
- Valve safety is enhanced with a non-removable stainless steel stem
- No special flow direction required
- Full temperature range: -76 °F to 302 °F
- 754 psig rated - valves for higher operating pressure available upon request

EVRA / EVRAT - Flanged Solenoid Valves

Type	Cv	Nom. Port Size Inches	Min. Open dp psi	Available Connections				List Prices Less Coil ¹
				FPT	SOC	BW	ODS	
Direct Operated or Assisted Lift (zero DP needed for valve to be open)								
EVRA3	0.3	⅛"	0	⅜", ½"	⅜", ½", ¾"	⅜", ½", ¾"	⅝", ⅞"	\$316
EVRAT 10	1.8	⅜"	0	⅜", ½"	⅜", ½", ¾"	⅜", ½", ¾"	⅝", ⅞"	\$342
EVRAT 15	3.2	½"	0	⅜", ½"	⅜", ½", ¾"	⅜", ½", ¾"	⅝", ⅞"	\$371
EVRAT 20	5.3	¾"	0	¾", 1"	¾", 1", 1¼"	¾", 1", 1¼"	⅞", 1⅝"	\$476

¹ Price does not include coil. Coil must be ordered separately; see page 26 for coil ordering.



Stainless steel valves available. Consult Danfoss for pricing and availability.

ICS Solenoid Valve - Direct Weld Body (Steel)

Type	Cv	Module Port Size Inches	Min. Open dp psi	Available Connections				List Prices Less Coil ¹
				FPT	SOC	BW	ODS	
Pilot Operated								
ICS 25-5	2	3/16"	2.9	3/4", 1"	3/4", 1"	3/4", 1", 1 1/4"	7/8", 1 1/8", 1 3/8"	\$480
ICS 25-10	4.1	3/8"	2.9	3/4", 1"	3/4", 1"	3/4", 1", 1 1/4"	7/8", 1 1/8", 1 3/8"	\$480
ICS 25-15	7	5/8"	2.9	3/4", 1"	3/4", 1"	3/4", 1", 1 1/4"	7/8", 1 1/8", 1 3/8"	\$480
ICS 25-20	9.3	3/4"	2.9	3/4", 1"	3/4", 1"	3/4", 1", 1 1/4"	7/8", 1 1/8", 1 3/8"	\$480
ICS 25-25	13.3	1"	2.9	1"	1"	1", 1 1/4"	7/8", 1 1/8", 1 3/8"	\$546
ICS 32	20	1 1/4"	2.9	-	1 1/4"	1 1/4", 1 1/2"	1 3/8", 1 5/8"	\$710
ICS 40	31	1 1/2"	2.9	-	1 1/2"	1 1/2", 2"	1 5/8"	\$1,054
ICS 50	51	2"	2.9	-	2"	2", 2 1/2"	2 1/8"	\$1,197
ICS 65	81	2 1/2"	2.9	-	2 1/2"	2 1/2", 3"	2 5/8"	\$1,572
ICS 80	98	3"	2.9	-	-	3"	-	\$1,844
ICS 100	165	4"	2.9	-	-	4"	-	\$3,387
ICS 125	240	5"	2.9	-	-	5"	-	\$5,360
ICS 150	410	6"	2.9	-	-	6"	-	\$9,381

¹ Price does not include coil. Coil must be ordered separately; see page 26 for coil ordering.



Solenoid Valves

Danfoss solenoid valves are designed and built for industrial applications. They can be installed in suction lines, return lines (liquid/vapor), pressure-equalizing lines, or bypass lines.

- Assisted lift, servo-operated (EVRAT). No pressure drop needed to open valve.
- Pilot operated with direct weld body 3/4 in. to 6 in. (ICS)
- Closed-coupled strainer available up to 3/4 in. for type EVRA/EVRAT.

See page 19 for ICS description. See page 30 for available strainers.

ICSH Dual Position Solenoid Valves

Type	Full Open Cv	Module Port Size Inches	Available Connections (in.)		List Prices Less Coil ¹
			SOC	BW	
Pilot Operated					
ICSH 25-25	13.3	1"	1"	1", 1¼"	\$1,204
ICSH 32	20	1¼"	1¼"	1¼", 1½"	\$1,266
ICSH 40	31	1½"	1½"	1½", 2"	\$1,669
ICSH 50	51	2"	2"	2", 2½"	\$1,892
ICSH 65	81	2½"	2½"	2½", 3"	\$2,303
ICSH 80	98	3"	-	3"	\$2,574

¹ See below for ordering the two needed coils per valve.



Coils for Solenoid Valves

Standard Encapsulated Solenoid Coils with Terminal Box

Voltage	Hz	Connection	Part No.	List Price
110 AC	60	Terminal Box	018F6813	\$55
24 AC	60	Terminal Box	018F6815	\$55
220 AC	60	Terminal Box	018F6814	\$55
24 DC	-	Terminal Box	018F6857	\$92

Coil with terminal box



Encapsulated Solenoid Coils with Terminal Box and Built-in Pilot Light

Voltage	Hz	Color	Connection	Part No.	List Price
110 AC	60	GREEN	Terminal box with pilot light	018F6816	\$100

Note: Please contact Danfoss if other coil types are needed.

Encapsulated Solenoid Coils with DIN plug or conduit connection. (approved for use in Canada)

Voltage	Hz	Connection	Part No.	List Price
110-120 AC	60	1/2" female conduit, 36" leads*	018F4113	\$55
24 AC	60	1/2" female conduit, 18" leads*	018F4102	\$55
208-240 AC	60	1/2" female conduit, 18" leads*	018F4122	\$55
110-120 AC	60	DIN connector**	018F7991	\$55

* UL listed coil

** UL recognized coil

Coil with leads



AKVA Pulse - width Modulation Expansion Valves

Type	Nom. TR (R717)	Connections	List Prices Less Coil ¹	Strainer ² Part No.	Valve Only* Part No.
AKVA10-1	1.1	½" inlet x ¾" outlet DIN butt-weld	\$565	Has a small built-in strainer but an external strainer is recommended to give extra protection.	068F3281
AKVA10-2	1.8		\$565		068F3282
AKVA10-3	2.8		\$565		068F3283
AKVA10-4	4.5		\$565		068F3284
AKVA10-5	7.1		\$565		068F3285
AKVA10-6	11.4		\$565		068F3286
AKVA10-7	17.9		\$565		068F3267
AKVA15-1	35	¾" or 1" FPT, SW, ANSI BW or 1¼" SW, ANSI BW	\$840	Please select an FIA strainer with 100 µm (150 mesh) insert. See strainers type FIA.	*
AKVA15-2	60		\$840		*
AKVA15-3	90		\$840		*
AKVA15-4	140		\$840		*

¹ Price includes valve and flanges where applicable. Price does not include coil which must be ordered separately.

² A 100 µm strainer must be mounted in front of AKVA 15 valves. Price will depend on the selected FIA filter.

* Contact Danfoss for p/n.

OPTION 1 FOR AKVA 10, AKVA 15, AND AKVA 20 LIQUID LEVEL CONTROL

Type	Description	Part No.	List Price
EKE 347	Electronic Liquid Level Control ¹	080G5000	\$1,022
Coil	24 V, 12 W, 60Hz standard coil with terminal box for use with AKVA valve	018F6815	\$55

OPTION 2 FOR AKVA 10, AKVA 15, AND AKVA 20 EVAPORATOR CONTROL

Type	Description	Part No.	List Price
EKC 315A	Evaporator Controller (superheat) ¹	084B7086	\$1,190
AKS 33	Pressure transducer with ¼" MPT and DIN plug. Range 0-200PSIA and 4-20mA output ²	060G1711	\$335
MBT 5250	Temperature sensor, PT 1000 with ½" NPT well, 2" insertion length ^{2,3}	084Z3031	\$175
Coil	24 V, 12 W, 60Hz standard coil with terminal box for use with AKVA valve	018F6815	\$55

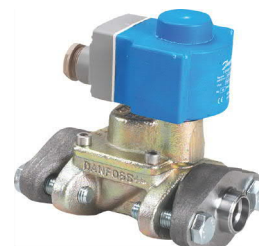
¹ Requires 24 V A.C., 50/60 Hz, 60 VA power supply. Supplied by others.

² Other pressure ranges, temperature ranges, connection types and sensor mounting styles available. Please see pressure and temperature sensors section or consult Danfoss for assistance.

³ Temperature Range -58°F to +392°F, DIN electrical connection.

Features

- ½ in. to 2 in.
- -58 °F to 302 °F
- 1-900 TR capacity range for ammonia applications
- Pulse width modulating electronic expansion valve
- AKVA does not require manual adjustments for changes in capacity (10 to 100%)



ICM Series 20 to 65 - Motorized Valves for Expansion and Pressure Regulation

ICM MOTORIZED VALVE INCLUDING MOTOR ACTUATOR

Valve Size	Flow Coefficient Cv (Kv)		Connection type and size				List Price *
			FPT	SW	BW	ODS	
ICM 20-A33	0.23	(0.2)	3/4"	3/4"	3/4", 1"	5/8", 7/8"	\$4,040
ICM 20-A	0.7	(0.6)	3/4"	3/4"	3/4", 1"	5/8", 7/8"	\$4,040
ICM 20-B66	1.8	(1.6)	3/4"	3/4"	3/4", 1"	5/8", 7/8"	\$4,040
ICM 20-B	2.8	(2.4)	3/4"	3/4"	3/4", 1"	5/8", 7/8"	\$4,040
ICM 20-C	5.3	(4.6)	3/4"	3/4"	3/4", 1"	5/8", 7/8"	\$4,040
ICM 25-A33	2.3	(2.0)	1"	1"	1", 1 1/4"	7/8", 1 1/8", 1 3/8"	\$4,308
ICM 25-A	7.0	(6.0)	1"	1"	1", 1 1/4"	7/8", 1 1/8", 1 3/8"	\$4,308
ICM 25-B	13.9	(12)	1"	1"	1", 1 1/4"	7/8", 1 1/8", 1 3/8"	\$4,308
ICM 32-A	10.4	(9)	-	1 1/4"	1 1/4", 1 1/2"	1 3/8", 1 5/8"	\$4,509
ICM 32-B	20	(17)	-	1 1/4"	1 1/4", 1 1/2"	1 3/8", 1 5/8"	\$4,509
ICM 40-A	17	(15)	-	1 1/2"	1 1/2", 2"	1 5/8"	\$4,923
ICM 40-B	30	(26)	-	1 1/2"	1 1/2", 2"	1 5/8"	\$4,923
ICM 50-A	27	(23)	-	2"	2", 2 1/2"	2 1/8"	\$5,130
ICM 50-B	46	(40)	-	2"	2", 2 1/2"	2 1/8"	\$5,130
ICM 65-A	41	(35)	-	2 1/2"	2 1/2", 3"	2 3/8"	\$6,975
ICM 65-B	81	(70)	-	2 1/2"	2 1/2", 3"	2 3/8"	\$6,661

* ICM valve sizes 20, 25, 32, 40, 50 and 65 are supplied with ICAD motor with 9.8 ft cables.

In general, ICM valves with an "A" cone and all ICM 20 cones sizes are used for liquid make-up or expansion applications. ICM valves with a "B" cone are used for motorized solenoid and regulator valve applications.

ICM Series 100 to 150 - Motorized Regulating Valve and Motor Actuator (Valve and actuator purchased separately)

Valve Size	Flow Coefficient Cv (Kv)		Nom. Port Size Inches	Connection Type/Size	Part No. *		List Price *	
					Valve w/o Motor	ICAD 1200 Motor	Valve w/o Motor *	ICAD 1200A Motor *
ICM 100-B	165	(142)	4"	4" BW	027H7131	027X0168	\$6,183	\$2,564
ICM 125-B	259	(223)	5"	5" BW	027H7151	027X0168	\$8,146	\$2,564
ICM 150-B	430	(370)	6"	6" BW	027H7171	027X0168	\$11,330	\$2,564

* ICM valve and ICAD 1200A motor actuator must be ordered separately when ordering ICM 100, ICM 125 and ICM 150. ICAD 1200A motor actuator is required for the ICM valve to operate.

Features:

- Direct-weld connections to eliminate leak potential
- Adjustable speed digital stepper motor (Input: 4-20 mA; 0-20 mA; 0-10 VDC; 2-10 VDC)
- Magnetically coupled motor and valve are independently sealed to eliminate valve stem leakage and allow motor replacement while the system is still under pressure
- Digital display on motor constantly shows valve position and valve settings are easily programmed with three buttons on the display
- Low temperature steel body, media range: -76 °F to +167 °F
- Stainless steel bolts
- 754 psig rated



Flanged ICM HMMR/HMMV drop-in

Valve Size	Flow Coefficient Cv (Kv)		Part No. *	List Price *
ICM 25 HMMR 1"	7.0	(6)	148X0859	\$4,308
ICM 25 HMMV 1"	13.9	(12)	148X0865	\$4,308
ICM 32 HMMR 1¼"	10.4	(9)	148X0861	\$4,508
ICM 32 HMMV 1¼"	20	(17)	148X0867	\$4,508
ICM 40 HMMR 1½"	17	(15)	148X0862	\$4,923
ICM 40 HMMV 1½"	30	(26)	148X0868	\$4,923
ICM 50 HMMR 2"	27	(23)	148X0863	\$5,130
ICM 50 HMMV 2"	46	(40)	148X0869	\$5,130
ICM 65 HMMV 2½"	81	(70)	148X0892	\$6,662



* ICM HMMR/HMMV valves are supplied with ICAD motor with 9.8 ft cables, flange gaskets and flange bolts.

In general, ICM HMMR valves are used for liquid make-up or expansion applications. ICM HMMV valves are used for motorized solenoid and regulator valve applications.

ACCESSORIES

Description	Part No. *	List Price *
24Vd.c., 2.5 Amp power supply for ICAD 600 and ICAD 900 motors*, 100-240Va.c. input. DIN rail or surface mounted.	080Z0055	\$262
Protection Cap for ICAD motor actuator (2nd Generation ICAD produced after 2009)	027H0431	\$42
Magnetic tool for manually operating ICM valve sizes 20, 25 and 32	027H0180	\$186
Magnetic tool for manually operating ICM valve sizes 40, 50, 65, 100, 125 and 150	027H0181	\$205
ICAD-UPS **, battery backup for multiple ICM/ICAD motorized valves	027H0182	\$1,021

* 24Vd.c. power supply can support a maximum of two ICAD 600A motors (for ICM 20-32) or one ICAD 1200A motor (for ICM 40-150).

** ICAD-UPS can support up to 8 pcs. of ICAD 600A motors (ICM 20-32) or 5 pcs. of ICAD 1200A motors (ICM 40-150).

24Vdc
Power Supply



ICAD - UPS



FA - Strainers for Direct Fitting on Solenoid Valves (close-couple strainers)

Valve Size	Nom. Port Size	Will Directly Fit with Solenoid Valves Type/Size	Part No.	List Price
FA 15	½"	EVRA 3	006-0043	\$95
FA 15	½"	EVRA 10, EVRAT 10, EVRA 15, EVRAT 15	006-1012	\$95
FA 20	¾"	EVRA 20, EVRAT 20	006-1013	\$121

Purge Valve Drain Kits for FA Strainers

Purge Valve Kit	Description	Part No.	List Price
For use with FA 15	Includes ¼" gauge valve type SNV, FA cover with ¼" NPT connection and plug	027X0151	\$79
For use with FA 20	Includes ¼" gauge valve type SNV, FA cover with ¼" NPT connection and plug	027X0152	\$79

FIA - Strainers (Filters) ½ in. – 12 in.

Size		Type	List Price w/ Plain Element		List Price w/ Pleated Element	
Inches	(mm)		Angle	Globe	Angle	Globe
½"	(15)	FIA 15	\$199		\$239	
¾"	(20)	FIA 20	\$205		\$245	
1"	(25)	FIA 25	\$255		\$279	
1¼"	(32)	FIA 32	\$260		\$284	
1½"	(40)	FIA 40	\$294		\$318	
2"	(50)	FIA 50	\$437		\$437	
2½"	(65)	FIA 65	\$666		\$666	
3"	(80)	FIA 80	\$789		\$789	
4"	(100)	FIA 100	\$1,250		\$1,250	
5"	(125)	FIA 125	\$1,926	\$2,089	\$1,926	\$2,153
6"	(150)	FIA 150	\$2,596	\$2,849	\$2,596	\$2,949
8"	(200)	FIA 200	\$4,727	\$5,317	\$4,727	\$5,505
10"	(250)	FIA 250	\$6,660	-	-	-
12"	(300)	FIA 300	\$8,855	-	-	-



Stainless steel valves available. Consult Danfoss for pricing and availability.

Note: Please specify mesh size when ordering.

Mesh is the number of threads per inch.

μ (microns) is the distance between two threads (1μ = 1/1000 mm)

150 Mesh/ 100 μ: Recommended before electronic expansion valve type AKVA or before very sensitive equipment
 100 Mesh/ 150 μ: For use in liquid line to give the best protection
 72 Mesh/ 250 μ: For use in liquid or suction lines.
 38 Mesh/ 500 μ: For use before pumps or in suction lines

Note: FIA 15 to 40 are standard with ¼ in. NPT drain plug in cover. FIA 50 to 200 will ship with an adapter to convert the drain connection in cover to ¼ in. NPT. See page 24 for available purge valves.

Filter Bags for Plant Start Up

50 micron / includes support frame

Type FIA Filter Size		Filter Bags	
Inches	(mm)	Part No.	List Price
2"	(50)	148H3150	\$191
2½"	(65)	148H3151	\$221
3"	(80)	148H3152	\$271
4"	(100)	148H3153	\$381
5"	(125)	148H3154	\$566
6"	(150)	148H3155	\$836
8"	(200)	148H3156	\$1,142

Additional Price for Magnetic Inserts

Type FIA Filter Size		Filter Bags	
Inches	(mm)	Part No.	List Price
2½", 3", 4"	(65, 80, 100)	148H3447	\$199
5", 6", 8"	(125, 150, 200)	148H3448	\$282

Replacement Strainer Elements for FIA Strainers

Type FIA Strainer Size		Part Number for Pleated Element			List Price
Inches	(mm)	100 Mesh/ 150 μ	72 Mesh/ 250 μ	38 Mesh/ 500 μ	
½", ¾"	(15, 20)	148H3303	148H3363	-	\$114
1", 1¼", 1½"	(25, 32, 40)	148H3304	148H3269	-	\$119
2"	(50)	148H3179	148H3184	148H3189	\$198
2½"	(65)	148H3180	148H3185	148H3190	\$224
3"	(80)	148H3181	148H3186	148H3191	\$295
4"	(100)	148H3182	148H3187	148H3192	\$475
5"	(125)	148H3183	148H3188	148H3193	\$718
6"	(150)	148H3226	148H3293	-	\$1,047
8"	(200)	148H3297	148H3294	-	\$1,385

Mesh is the number of threads per inch.

μ (microns) is the distance between two threads (1μ = 1/1000 mm).

100micron elements should be used before pulse expansion valves type AKVA or other sensitive equipment.

Type FIA Strainer Size		Part Number for Plain Element				List Price
Inches	(mm)	150 Mesh/ 100 μ	100 Mesh/ 150 μ	72 Mesh/ 250 μ	38 Mesh/ 500 μ	
½", ¾"	(15, 20)	148H3122	148H3124	148H3126	148H3128	\$73
1", 1¼", 1½"	(25, 32, 40)	148H3123	148H3125	148H3127	148H3129	\$95
2"	(50)	148H3157	148H3130	148H3138	148H3144	\$198
2½"	(65)		148H3131	148H3139	148H3145	\$224
3"	(80)		148H3119	148H3120	148H3121	\$295
4"	(100)		148H3132	148H3140	148H3146	\$475
5"	(125)		148H3133	148H3141	148H3147	\$718
6"	(150)		148H3134	148H3142	148H3148	\$1,047
8"	(200)		148H3135	148H3143	148H3149	\$1,385
10"	(250)		148H3136	148H3175	148H3177	\$1,748
12"	(300)		148H3137	148H3176	148H3178	\$2,558

Mesh is the number of threads per inch.

μ (microns) is the distance between two threads (1μ = 1/1000 mm).

ICLX - Gas Powered Stop Valves Globe with Two-Step Opening (1 1/4 in.- 6 in.)

Valve Size	Cv	Nom. Port Size Inches	Min. Open dp psi	Available Connections			List Prices Less Coil
				SOC	WN	ODS	
Gas Powered Valve							
ICLX 32	26	1¼"	0	1¼"	1¼", 1½"	1⅜", 1⅝"	\$1,609
ICLX 40	34	1½"	0	1½"	1½", 2"	1⅝"	\$1,775
ICLX 50	55	2"	0	2"	2", 2½"	2⅛"	\$1,828
ICLX 65	96	2½"	0	2½"	2½", 3"	2⅝"	\$2,219
ICLX 100	175	4"	0	-	4"	-	\$3,728
ICLX 125	261	5"	0	-	5"	-	\$5,633
ICLX 150	452	6"	0	-	6"	-	\$8,545

¹ Coil must be ordered separately; see page 26 for coil ordering. Each ICLX valve needs 2 coils.



ICLX Features:

- Normally closed
- Internal bypass with 2-step seat
- Internal bleed relief
- Only one electrical output needed for opening and closing the valve
- Direct weld connections to eliminate leak potential
- ICLX is 754 psig rated

DCR Filter Driers (Replaceable Cores Not Included)

Type	Filter Size	Required No. of Cores*	Steel Connections**		Filter Only Part No. *	List Price
			Butt-weld	Solder (ODF)		
DCR 0489	48 cu. in.	1	1"	1 1/8"	023U7053	\$435
DCR 09611	96 cu. in.	2	1 1/4"	1 3/8"	023U7061	\$485
DCR 14413	144 cu. in.	3	1 1/2"	1 5/8"	023U7068	\$593
DCR 19217	192 cu. in.	4	2"	2 1/8"	023U7074	\$698

* Cores must be ordered separately. See below table.

** Steel connections are both butt-welded and solder according to the connection sizes listed.

Replaceable Cores For DCR Filter Driers (Each core includes DCR cover gasket)

Type	Filter Size	Single Pack		Bulk Pack*	
		Part No.	List Price Each	Part No. *	List Price Each *
48-DM	100% molecular sieve core (provides high moisture adsorption) optimized for HFC refrigerants: R134a, R404A, R410A, R507, R744 (CO2), etc. Can be used with R22.	023U1391	\$52	023U1392	\$43
48-DC	80% molecular sieve 20% activated alumina (absorbs moisture and acid in system) core optimized for CFC and HCFC refrigerants: R22, R502, etc. Can be used for HFC's.	023U4380	\$52	023U4381	\$43

* Receive an additional discount when purchasing the bulk pack part number which must be purchased in multiples of 8 pcs. at any given time. Example: When ordering 8 pcs., 16 pcs., 24 pcs., etc. of the bulk pack p/n, you will receive 8 pcs. in a box with 1 set of instructions.



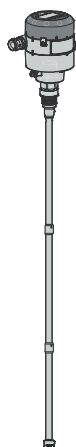
Standard with 1/4 in.
NPT purge connection
in end cover

AKS 4100U - Liquid Level Sensors

The AKS 4100U liquid level sensor uses proven TDR Guided Radar technology to ensure a high degree of accuracy and reliability.



Description	Part No.	List Price
AKS 4100U Cable Level Sensor with LCD display/interface unit and 3/4" NPT connection. The insertion cable length can be trimmed to desired length within the range of 31.5" to 196" in length during installation.	084H4521	\$2,979



Description	Probe length	Part No.	List Price
AKS 4100U Coaxial D14 Level Sensor with LCD display/interface. Probe lengths 55" and 85" can be cut to a shorter length during installation but not less than 19.2" in probe length.	19.2 inches	084H4530	\$3216
	55 inches	084H4533	\$3339
	85 inches	084H4535	\$3424



Description	Probe length	Part No.	List Price
AKS 4100U Fixed Length Coaxial D22 Level Sensor with LCD display/interface.	11 inches	084H4536	\$2,979

Benefits:

- One part number covers a wide range of lengths and is easily adjusted to the required length in the field.
- No on-site calibration is needed.
- Cable version is not affected by oil in the system.
- Cable version is very compact making it easy to handle, ship, and install.
- Standard with LCD display for quick on-site commissioning and troubleshooting.
- One probe for all common refrigerants including ammonia, R-22, R-404A, R-134a, and R-507. For CO₂ and other refrigerants, please contact Danfoss.

Technical details of AKS 4100

- Standard level sensor is used for insertion lengths 196 in. (5000 mm) and down. The cable length is easily trimmed to the desired length during installation. Longer lengths available upon request.
- 3/4 in. NPT connection
- 4-20 mA signal that is 2-wire loop powered
- Maximum working pressure: 1450 psi (100 bar)
- Temperature range: -76 °F to 212 °F (-60 °C to 100 °C)



LCD Display/Interface Unit

Liquid Level Glasses



List Pricing

Presented by H.A. Phillips & Co.

Effective: January 18, 2021

LLG - Liquid Level Glasses 7¼ in. – 61 in.

LIQUID LEVEL GLASSES - LLG

With safety system and welding nipples *

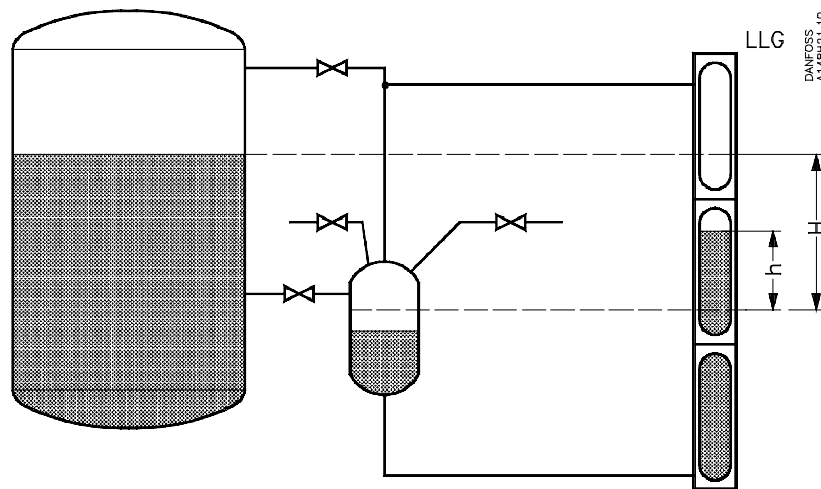
LIQUID LEVEL GLASSES - LLG F

With safety system, welding nipples* and frost shield

Length**		Type	Part No.	List Price	Type	Part No.	List Price
Inches	(mm)						
7¼"	(185)	LLG 185	027X0179	\$681	LLG 185 F	027X0345	\$995
13¼"	(335)	LLG 335	027X0180	\$898	LLG 335 F	027X0326	\$1,224
23¼"	(590)	LLG 590	027X0288	\$1,525	LLG 590 F	027X0268	\$2,064
29¼"	(740)	LLG 740	027X0263	\$1,862	LLG 740 F	027X0261	\$2,428
39¼"	(995)	LLG 995	027X0294	\$2,173	LLG 995 F	027X0349	\$2,771
45"	(1145)	LLG 1145	027X0305	\$2,598	LLG 1145 F	027X0343	\$3,184
61"	(1550)	LLG 1550	027X0333	\$3,778	LLG 1550 F	027X0328	\$4,416

* The welding nipples extend 3.25" from the level glass and can easily be welded into a ½" socket-weld connection.
If shut-off valves are needed, please see ½" socket-weld shut-off valves type SVA.

** Length between LLG connections.



LEVEL EYE® (LIQUID LEVEL SIGHT GLASSES)

Manufactured by H.A. Phillips & Co.

Part No.	Housing Length In.	Description	Danfoss List Price
1100-R	2"	Square End housing with Reflex Lens	\$148
1100-RN	2"	Square End housing with Reflex Lens and Frost Shield	\$183
1100C-R	2"	Saddle Milled housing with Reflex Lens	\$158
1100C-RN	2"	Saddle Milled housing with Reflex Lens and Frost Shield	\$195
1100A-R	3"	Square End housing with Reflex Lens	\$167
1100A-RN	3"	Square End housing with Reflex Lens and Frost Shield	\$203
1100L-RN	4"	Square End housing with Reflex Lens and Frost Shield	\$228

Contact Danfoss for other configurations.



Oil Drain Valves and Float Switches



List Pricing

Presented by H.A. Phillips & Co.

Effective: January 18, 2021

QDV - Quick Closing Oil Drain Valve ½ in. and ¾ in. ANGLE FLOW

Size		Type	Connections		Part No.	List Price
Inches	(mm)		Inlet	Outlet		
½"	(15)	QDV 15	½" FPT	½" FPT	148H3273	\$333
¾"	(20)	QDV 15	¾" FPT	¾" FPT	148H3274	\$339
QDV 15 Valve Train*						
½"	(15)	QDV 15 Valve Train	½" SOC	½" FPT	148H3311	\$490

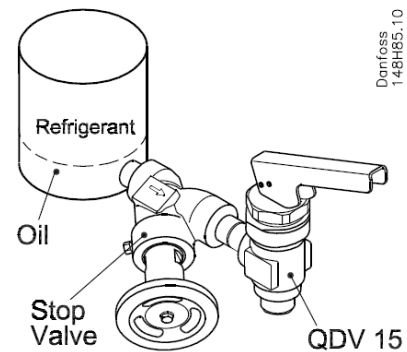
* QDV valve train includes QDV 15 with ½" FPT x ½" FPT connections and an SVA-ST 15 globe stop valve with hand wheel and ½" socket-weld inlet x ½" male NPT outlet connections for quick on site mounting.

Features

- ½ in. and ¾ in. FPT connections
 - Handle can be rotated 360°
 - Spring-loaded handle closes immediately upon release
 - Internal relief device prevents hydraulic pressure build-up
- The internal relief device in the Danfoss QDV allows trapped refrigerant to slowly bleed if internal valve pressure exceeds approx. 363 psig. Further, the valve is easily actuated by hand (without tools), and has an internal spring mechanism to instantly close the valve if the actuator is let go.



QDV



QDV Valve Train

AKS 38 - Liquid Level Float Switch

Type	Connections	Part No.	List Price
AKS 38	1" Socket Weld	148H3206	\$832
AKS 38	¾" FPT	148H3207	\$832
AKS 38	1" BW	148H3204	\$858

Flanges included with AKS-38 Float Switch.
Contact Danfoss for other connection types/sizes.



Features

- Reliable SPDT micro switch
- Protection from high and low levels
- Operates liquid solenoid valve
- Transparent switch box cover for visual indication
- Switch box can be rotated to improve visibility

GD - Gas Detectors

Type	Refrigerants	Sensor Type/Range (PPM)	Alarms (PPM)	Basic (w/o Display)		Premium w/ Display (Flex)		Premium Duplex w/ Display (2 sensors*)		Premium w/ Display & Remote Sensor**	
				Part No.	List Price	Part No.	List Price	Part No.	List Price	Part No.	List Price
GDA	Ammonia (R717)	EC 100	25/35	148H6000	\$962	148H6006	\$1,441	148H6004	\$1,801	148H6005	\$1,914
		EC 300	25/150	148H6008	\$962	148H6013	\$1,441	148H6012	\$1,801	-	-
		EC 1000	500/900	148H6014	\$962	148H6020	\$1,441	148H6018	\$1,801	148H6019	\$1,914
		-	-	-	-	148H6027	\$1,201	148H6037	\$1,561	-	-
		-	-	-	-	-	-	-	-	148H6034	\$1,672
		CT: Pellistor LEL Sensor	30000 (21%)	-	-	148H6038	\$1,201	-	-	-	-
GDC	GDC - CO ₂	IR 10000	5000/9000	-	-	148H6040	\$1,441	-	-	-	-
		IR 40000	10000/18000	-	-	148H6041	\$1,441	-	-	-	-
GDHC	HCFC R123a	SC2000	500/900	Contact Danfoss		148H6044	\$1,201	-	-	-	-
GDHF	HFC R404A, R507	SC2000	500/900			148H6049	\$1,201	-	-	-	-
	HFC R134A	SC2000	500/900			148H6052	\$1,201	-	-	-	-

* 2nd sensor in Duplex version is always a Pellistor (Catalytic Bead) LEL sensor. Temperature range: -4 to 122 °F

** Remote sensor with 16.4 ft. (5 m) cable

EC = Electrochemical; Temperature range: -4 to 122°F (with display), /-40 to 122°F (w/o display)

SC = Semiconductor/Solid State; Temperature range: 14 to 122°F

IR = Infra-Red; Temperature range: -4 to 122°F



CONTROL SYSTEM FOR GD SENSORS

Description	Part No.	List Price
Controller unit for GD gas detectors. DIN rail mounted in customer supplied panel box, 24VDC, 150 mA power needed	148H6231	\$1,038
Controller expansion module	148H6222	\$578
Modbus for controller incl. gateway	148H6228	\$2,419
Wire break monitoring/warning module	148H6223	\$2,352

ACCESSORIES

Description	Part No.	List Price
Service Tool which is required to program sensors w/o a display	148H6224	\$789
Buzzer (85 dB within 4 in.) & 3 color LED light indicator for mounting on GD sensor	148H6225	\$282
Splash Guard for sensor	148H6226	\$100

Features

- New Digital sensor technology gives an extended lifetime
- Digital sensor with sensor life expectancy
- Easy replacement with pre-calibrated sensor
- Each gas detector can have up to 2 independent sensors
- 3 relays with SPDT contacts included for stand-alone operation
- Up to 4 configurable alarm set points per sensor
- All standard with 4-20 mA output and RS485 Modbus connections

Contact Danfoss about optional UPS battery backup, remote sensors etc.



Controller and System

Controller unit

Code Number 148H6231

Used for a centralized monitoring and warning. The input signals for the controller are collected via RS485 or analog communication. The controller can handle up to 96 digital sensors via Fieldbus and four (4) analog input. An additional 28 analog input is possible using seven (7) expansion modules (4-20 mA signal interface). The total number of connected sensors should not exceed 128 sensors. The controller unit can be employed as pure analog controller, as analog/digital, or as digital controller. Configuration is menu-driven via the keypad. For fast and easy configuration, the PC Tool is recommended.



Controller expansion module

Code Number 148H6222

The gas detection Controller Expansion module is used for expansion of the cable coverage in terms of number of loops and the total wire length. Each Controller Unit can handle up to 7 Expansion modules allowing additional 7 segments with a total of 7200 meters (23622 ft.) wiring and a total of 32 relays for alarm device circuits.



Wire break warning module

Code Number 148H6223

The warning module is used for monitoring the circuiting to the warning/alarm devices on a centrally controlled gas detection system. Wire breaks or wire interruptions in the alarm device loop will be reported to the central control.



Gateway

Code Number 148H6228

The gateway is a communication module that can be added to the controller and is used for communicating via Modbus TCP/IP.



Service and Calibration

Service tool

Code Number 148H6224

For interface with units with no display (Basic, Basic+, Premium, Premium+). Acts as a portable display and can be connected to all Danfoss gas detection units (Heavy Duty w. adapter).



PC tool

Code Number 148H6235

The PC tool is a menu-driven and standalone software used for easy addressing, parameter setting, calibration, and data logging of the Basic, Premium and Heavy Duty gas detection units, and the controller unit.



Calibration adapter

Code Numbers 148H6232 and 148H6233

The calibration adapter is required for connecting the calibration gas container, via the flow regulator, to the sensor head on the gas detection units. (Two variants, one for Basic and Premium plastic sensor heads (148H6232); one for Heavy Duty and Premium remote Steel sensor heads (148H6233).



Other

Buzzer and light alarm

Code Number 148H6225

Can be installed in Basic or Premium units providing a local alarm.



Air Duct Set

Code Number 148H6236

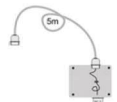
The air duct set is specially designed to capture the airflow in air ducts. It can be connected to the standard sensor heads, except from Heavy Duty gas detection units.



Remote kit

Code Number 148H6238

Enabling installation of a plastic sensor head in a plastic housing 5m (16.4 ft.) from the unit. This means that the gas detection unit can be placed outside the room where the sensor is placed to detect hazardous gases, allowing reading of and interfacing with the unit without entering the dedicated space. Basic and Premium gas detection units.



Seal cap

Code Number 148H6227

Airtight seal cap to protect the sensor head against premature exposure during installation. The seal cap is mounted on new sensors (complete units and replacement sensors) but is also available as an accessory.



Splash guard

Code Number 148H6226

To protect the sensor head against water exposure during wash-down cleaning and rinsing operations.



AKS - Pressure and Temperature Transmitters

AKS 33 (4 to 20 mA output) and AKS 32 (1 - 5 V output)

Type	Output Signal	Pressure Range	Part No.	List Price
MBS 3000	4 to 20 mA	0 to 14.5 psig	060G1563	\$335
AKS 33	4 to 20 mA	0 to 100 psia	060G3802	\$335
AKS 33	4 to 20 mA	0 to 200 psia	060G1711	\$335
AKS 33	4 to 20 mA	0 to 500 psig	060G1712	\$335
AKS 3000	4 to 20 mA	0 to 870 psig	060G1083	\$335
AKS 32	1 to 5 Vd.c.	0 to 100 psia	060G3803	\$335
AKS 32	1 to 5 Vd.c.	0 to 200 psia	060G3804	\$335
AKS 32	1 to 5 Vd.c.	0 to 500 psig	060G3805	\$335
Accessory for pressure transmitters				
Pulse snubber, 1/4" FPT x 1/4" MPT			060G0250	\$86

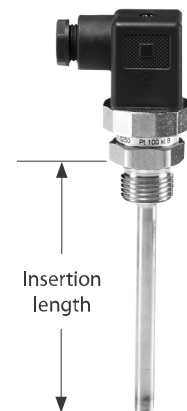
Features

- 1/4 in. male NPT connection
- DIN connector
- Stainless steel body and material in contact with medium
- Suitable for all refrigerants, including ammonia
- UL recognized for Class I, Group A, B, C, and D, Division 2
- Built-in voltage stabilizer for varying voltage supply



Temperature Sensors, PT 1000 ohm (For use with Danfoss controllers)

Type	Temperature Range	Description	Electrical connection	Part No.	List Price
AKS 21M	-94 to +356 °F	Surface/Air temperature sensor	8.2 ft. cable	084N2003	\$54
MBT 5250	-58 to +392 °F	Immersion temp. sensor with 1/2" NPT well, 2" insertion length	DIN connector	084Z3031	\$175
MBT 5250	-58 to +392 °F	Immersion temp. sensor with 1/2" NPT well, 4" insertion length	DIN connector	084Z2188	\$208
MBT 5250	-58 to +392 °F	Immersion temp. sensor with 1/2" NPT well, 6" insertion length	DIN connector	084Z2189	\$220
MBT 5250	-58 to +392 °F	Immersion temp. sensor with 1/2" NPT well, 8" insertion length	DIN connector	084Z2190	\$239



MBT 5250



Interchangeable measuring insert for MBT 5250

4-20 MA - Temperature Sensors, 4-20 mA Output (not for use with Danfoss controllers)

Type	Temperature Range	Description	Electrical connection	Part No.	List Price
MBT 5252	-58 to +302 °F	Immersion temp. sensor with 1/2" NPT well, 2" insertion length	Terminal box	084Z3029	\$308
MBT 3560	-58 to +302 °F	Immersion temp. sensor with 1/2" NPT well, 2" insertion length. In this version the sensor and well are integrated and would need replaced together	DIN connector	084Z4114	\$235



MBT 5252



MBT 3560

Electronic Controllers

Type	Description	Part No.	List Price
EKC 315A	Evaporator Superheat Controller	084B7086	\$1,190
EKE 347	Electronic Liquid Level Control.	080G5000	\$1,022
EKC 361	Electronic Media Temperature Controller for stand alone control	084B7060	\$888
EKE 400	Evaporator Controller w/ HMI. 24 V ac/dc	080G5004	\$1,071
	Evaporator Controller w/o HMI. 24 V ac/dc	080G5006	\$969



Accessories for Panel Mounting Controllers

Description	Part No.	List Price
EKC front panel mounting kit is used for mounting an EKC controller into an existing electrical panel box so the EKC display can easily be viewed through its transparent flip up door. This door also allows easy access to change EKC settings without opening the main electrical panel box.	027F0309	\$170
Remote interface graphical display for front panel mounting that connects to the EKE controller via CANbus. Powered by the EKE controller. UL approved, NEMA 3R rated.	080G0294	\$378

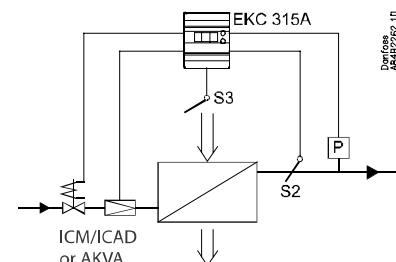
EKC 315 Evaporator controller

Application

The controller and valve can be used where there are requirements for accurate control of superheat and temperature in connection with refrigeration.

Functions:

- Regulation of superheat
- Temperature control
- MOP function
- Alarm if the set alarm limits are exceeded
- Relay output for solenoid valve
- PID regulation



EKE 347 Liquid Level Controller

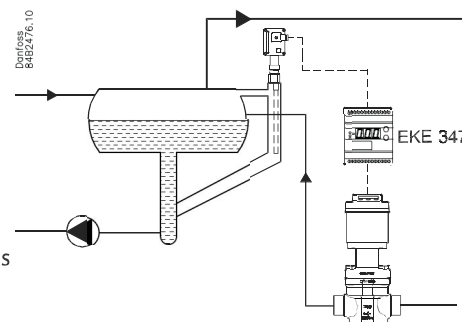
Application

The EKE 347 is a PI liquid level controller that can be used for regulation of refrigerant level in:

- Pump packages
- Separators
- Intermediate coolers
- Economizers
- Condensers
- Receivers

Functions:

- Standard with Modbus-RTU RS485 communication for easy integration with PLC systems
- Generates alarm when user-programmed limits are exceeded
- 3 relay outputs for upper and lower level limits and for alarm level
- Controls liquid level on high or low pressure side of the system
- When AKV/A is selected, a master-slave system can run up to 3 AKV/A valves with distributed opening degree
- Manual control of output
- Able to limit minimum and maximum valve opening degree



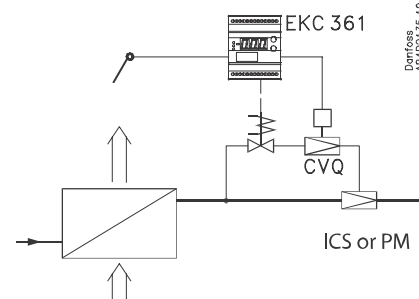
EKC 361 Media Temperature Controller

Application

The controller and valve can be used where there are stringent requirements to accurate temperature control in connection with refrigeration.

Functions:

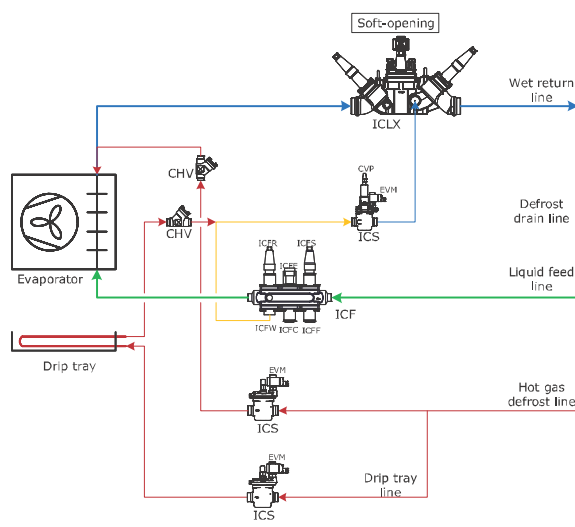
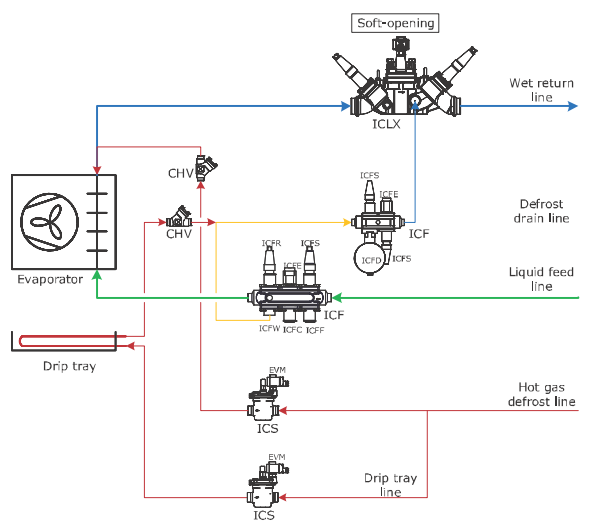
- Modulating temperature control
- ON/OFF input for start/stop of regulation of ICS/PM or forced closing of ICM
- Alarm if the set alarm limits are exceeded
- Relay output for fan
- Relay output for solenoid valves
- Input signal that can displace the temperature reference
- Output signal that follows the temperature showing on the display when not using the valve



Application

The decentralized approach makes standardizing system design easier.

- One dedicated controller per evaporator
- For small and large systems alike
- Applicable for defrosting flooded evaporators and DX evaporators
- Supports multiple defrost methods: Hot gas defrost, electrical defrost, and water/brine defrost
- MODBUS communication allows integration to central PLC system
- CANbus communication for interconnection of multiple EKE 400 controllers and process alignment.
- Can be used without central PLC as standalone



Danfoss Inc. 2009
DANFOSS INC. AIR-CONDITIONING & REFRIGERATION DIVISION
TERMS AND CONDITIONS OF SALE

Effective Date: August 1, 2009

1. **CONTROLLING PROVISIONS** – All deliveries of products and services ("Products") from Danfoss Inc. Air-conditioning & Refrigeration Division ("Danfoss") to any customer ("Customer") shall be governed exclusively by these Terms and Conditions. Danfoss' acceptance of Customer's offer is expressly conditioned upon Customer's acceptance of these Terms and Conditions and no addition to or modification shall be binding on Danfoss unless expressly agreed to in writing.

2. **ORDER CONFIRMATION** – Danfoss shall not be deemed to have accepted a purchase order until written, including electronic, confirmation of the order from Danfoss is received by Customer or Danfoss has received written, including electronic, timely and unconditional acceptance from Customer of Danfoss' quotation.

3. **TERMS OF DELIVERY**

- a. Risk of Loss - Delivery terms shall be F.O.B. Dock with risk of loss passing to Customer upon leaving Danfoss premises.
- b. Responsibility - Danfoss shall not be responsible for damage incurred during transportation. Claims for lost or damaged shipments shall be filed directly to the carrier by Customer. Exception: All UPS shipment claims must be filed by Danfoss. Scheduled shipping dates and time of delivery are approximate. Danfoss shall not be liable for any damage occurring as a result of late delivery or lost shipments. Any discrepancies in shipment must be reported within 5 working days of receipt.
- c. Delivery Options - Absent Customer's special instructions, Danfoss shall choose the carrier, which may not be the least expensive carrier. All products are shipped prepaid and add via ground transportation unless otherwise specified. If collect shipment is required via small parcel service a collect account number is required.

4. **HANDLING FEE** - A handling fee of \$50 will apply to all orders under \$100.

5. **SAME DAY REQUEST** – A surcharge of \$25 will be added to the order value for any shipments requested to ship same day.

6. **PACKING** – Disposable packing is included in the stated price and will not be credited if returned. Reusable packing is not included in the price and shall be returned in accordance with Danfoss' instructions and at Customer's expense.

7. **PAYMENT TERMS** – Subject to credit approval by Danfoss, payment terms are net 30 days from the date of invoice. Should Danfoss fail to approve Customer's credit or should Danfoss reverse its approval of credit for any reason whatsoever, the terms of payment, at Danfoss' option, shall be full advance payment prior to shipment or by credit card. Danfoss reserves the right to withhold any and all shipments if Customer's account is past due. The purchase price shall be paid in full without regard to any setoffs claimed by Customer.

8. **TAXES** – Customer agrees to provide Danfoss with its assigned tax exemption number and agrees to pay, in addition to the purchase price, all applicable sales, use, excise, value added or other similar taxes.

9. **PRODUCT ALTERATION** – Provided that no agreed technical specification is changed, Danfoss reserves the right to make alterations to Products without notice.

10. **WARRANTY** – Danfoss warrants that all supermarket electronic control Products will be free from defects in materials or workmanship for a period of 18 months following shipment. All other Products will be free from defects in design, materials or workmanship for a period of 18 months commencing on the date stamped on the applicable product or for a period of 12 months from the date of sale whichever comes first. Danfoss will honor warranty for 12 months from install date for aftermarket customers only based on valid proof of purchase. Under this warranty, Danfoss' full and exclusive obligation shall be to replace any Product that during the warranty period is found to be defective in design, materials or workmanship. Danfoss shall not be obligated to refund the purchase price, nor shall it be obligated to pay for any labor or costs associated with the removal of the defective Products or the reinstallation of those Products. No warranty coverage will be provided for Products that have been altered, used for a purpose other than that for which they were designed or installed contrary to Danfoss' instructions. DANFOSS MAKES NO WARRANTIES OR REPRESENTATIONS, EXPRESS OR IMPLIED, AS TO THE PRODUCTS, EXCEPT AS SET FORTH ABOVE. DANFOSS HEREBY DISCLAIMS ALL IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT WILL DANFOSS BE LIABLE FOR ANY LOST PROFITS OR FOR ANY DIRECT, INDIRECT, INCIDENTAL, CONSEQUENTIAL, PUNITIVE OR OTHER SPECIAL DAMAGES ARISING OUT OF OR RELATED TO ITS PRODUCTS REGARDLESS OF WHETHER SUCH DAMAGES ARE SOUGHT BASED ON CAUSES OF ACTION SOUNDING IN TORT, CONTRACT, NEGLIGENCE, STRICT LIABILITY OR BREACH OF WARRANTY.

11. **WARRANTY PROCEDURES** – To make a claim under the express warranty set forth in paragraph 11, Customer must (a) Notify the Danfoss Warranty Returns Department of the alleged defect; (b) Provide the part number, serial number, and description of the problem of the potentially defective Product; (c) Obtain a Return Material Authorization number from Danfoss, which shall be valid for 30 days; (d) Return the potentially defective Product, insurance and freight prepaid, with the outside of the package bearing the required return number

to Danfoss, (e) Include a written detailed statement of the reason why the Product is being returned; and (f) Ship the Products free of extraneous equipment. If a replacement Product is required, a PO must be provided to Danfoss to purchase the replacement Product. Only a current Danfoss Customer may order the replacement Product. An invoice will be created and mailed to the purchasing Customer upon shipment of the replacement Product. Provided the returned Product complies with the limited warranty and not physically damaged, Danfoss will credit the invoice for the purchased replacement Product.

12. NON-WARRANTY RETURNS - Subject to prior approval by Danfoss, unused standard Products can be returned within four (4) months of the Danfoss invoice date provided the Products are returned in original packaging and both Products and packaging are free from defects.

Products accepted to be returned for credit are subject to a 30% restocking fee. No credit will be issued for returned Products where the net amount involved is less than \$100. Products built or ordered to custom specifications or Products that have been modified by the customer cannot be returned for credit under any circumstances. The Products must be returned to Danfoss with insurance and freight prepaid.

13. CHANGE ORDER REQUEST— An accepted order that is scheduled to ship within the quoted lead time can be delayed once up to a maximum of 30-days. Orders outside of the quoted lead time can be changed or cancelled, but must be confirmed by Danfoss in writing. Cancelled orders are subject to a charge equal to 30% of value for standard Products. Custom or customer specific Product orders cannot be cancelled.

14. PRICE ADJUSTMENTS – Prices for Products are exclusive of VAT and/or other taxes or duties. Danfoss reserves the right to adjust accepted prices for non-delivered Products in the event of alterations in rates of exchange, variations in costs of materials, sub-suppliers' price increases, changes in wages, state requisitions or similar conditions over which Danfoss has no or limited control.

15. GROUP SET-OFF – Danfoss and any other company in the Danfoss Group shall be entitled to set off own claims against the Customer, in the Customer's possible claims against any of said companies.

16. PRODUCT INFORMATION – Any information – irrespective of derivation from Danfoss or a Danfoss business contact – including but not limited to information on weight, dimensions, capacity or any other technical data in catalogue descriptions, advertisements, etc. shall be considered informative, and are only binding if and to the extent, explicit reference on this is made in offer and/or order confirmation. Specific demands from the Customer are only binding if and to the extent they have been confirmed by Danfoss in writing.

17. PROPRIETARY INFORMATION AND CONFIDENTIALITY – Any non-public information, including but not limited to, drawings, descriptions and any other technical documents which Danfoss has made or may make available to the Customer ("Technical Information") shall remain the property of Danfoss and shall be treated as confidential by Customer and its representatives and must not, without the written consent of Danfoss, be copied, reproduced, or transferred to third parties or be used for other purposes than those intended when the Confidential Information was made available. Confidential Information shall be returned upon Danfoss' request.

18. PRODUCT LIABILITY – Danfoss shall not be liable for any damage to real property or chattels caused by the Product after it has been delivered and whilst it is in the possession of the Customer. Nor shall Danfoss be liable for any damage to products manufactured by the Customer or to products of which the Customer's products form a part.

If Danfoss incurs liability towards any third party for such damage as described in the preceding paragraph, the Customer shall indemnify, defend and hold Danfoss harmless.

Customer shall indemnify and hold Danfoss harmless for all claims arising from damage resulting from the use or operation of the Products because of the improper repair, maintenance or operation of the Products by Customer, the failure of Customer to adequately train personnel in the operation of the Products, Customer's failure to comply with applicable laws or regulations or otherwise.

If a claim for damage as described in this clause is lodged by a third party against either Danfoss or the Customer, the respondent party shall immediately inform the other party thereof in writing.

The Customer shall be obliged to let itself be summoned to the court or arbitral tribunal examining claims for damages lodged against one of them on the basis of damage allegedly caused by the Product.

19. SECONDARY DAMAGE – DANFOSS SHALL NOT BE HELD RESPONSIBLE FOR ANY SPECIAL, INDIRECT, CONSEQUENTIAL, PUNITIVE OR EXEMPLARY DAMAGE OR LOSS, WHICH MIGHT ARISE OUT OF ANY BREACH OF WARRANTY, FAULTY PRODUCTS, DELAY IN THE DELIVERY OF THE PRODUCTS, PRODUCT LIABILITY, RECALL OR OTHERWISE, IRRESPECTIVE OF THE CAUSE, INCLUDING BUT NOT LIMITED TO, LOSS OF PRODUCTION, LOSS OF PROFIT AND LOSS OF GOODWILL.

20. **MANDATORY LIABILITY** – Nothing in these Terms (including but not limited to the exclusions and limitations in clause 18 to 19) shall operate so as to exclude or limit the liability of either party to the other for death or personal injury arising out of its negligence, fraudulent misrepresentation or for any other liability which cannot be excluded or limited by law.

21. **NOTICE OF CLAIMS** – Claims or complaints as to defects of the Products or other claims shall be submitted in writing by Customer to Danfoss without undue delay.

22. **INTELLECTUAL PROPERTY RIGHTS** – If the Product is delivered with embedded software, Customer obtains a non-exclusive, software license in form of a right of use to the software solely for the purposes set out in the applicable specification of the Product. Aside from this, Customer obtains no rights in form of license, patent, copyright, trademark or other proprietary right connected to the Products. Customer shall not obtain any rights to source codes to such software.

23. **RESTRAINT ON RESALE AND USE FOR CERTAIN PURPOSES** – Danfoss products are produced for civilian use. Customer is not allowed to use or to resell the Products for purposes which have any connection to chemical, biological or nuclear weapons or for missiles which are capable of delivering such weapons. Customer is not allowed to sell the Products to persons, companies or any other kind of organization if Customer has knowledge of or suspects that said persons or entities are related to any kind of terrorist or narcotics activities. The Products may be subject to legal regulations and restrictions and may therefore be subject to restrictions in case of sale to countries/customers covered by export and import ban. These restrictions shall be observed in case of resale of the Products to such countries/customers.

Customer is not allowed to resell the Products if there is doubt or suspicion that the Products can be used for the purposes mentioned in the preceding paragraph. If Customer receives knowledge of or suspects that the conditions in this clause have been violated, Customer shall immediately inform Danfoss.

24. **GLOBAL COMPACT** – Danfoss has joined the United Nations' Global Compact initiative which means that Danfoss has undertaken to live up to 10 principles on human rights, employees' rights, the environment and corruption. These principles are listed in "Danfoss Code of Conduct for Suppliers" to be seen on www.danfoss.com. Therefore Danfoss encourages the Customer to comply with these fundamental principles. For further information on Global Compact: <http://www.unglobalcompact.org>

25. **PARTIAL INVALIDITY** – If one or more of the terms and conditions in these Terms and Conditions or any part of a term is deemed invalid, unenforceable, illegal or inoperable, the validity, enforceability, legality or operability of all further terms and conditions shall not be affected or diminished thereby.

26. **CHOICE OF LAW AND FORUM** – Any dispute between the parties arising from or in connection with a purchase agreement governed by these Terms and Conditions shall be settled pursuant to the laws of Maryland with the exception of the conflict of law provisions. The parties agree that Maryland courts shall be the exclusive forum for any dispute arising under this order. The parties expressly waive any objections based on personal jurisdiction or venue and consent to service of process by certified mail, return receipt requested.

Presented by H.A. Phillips & Co.

Presorted
Standard
U.S. Postage
PAID
Baltimore, MD
Permit 3361

ENGINEERING
TOMORROW

Danfoss

Engineering Tomorrow

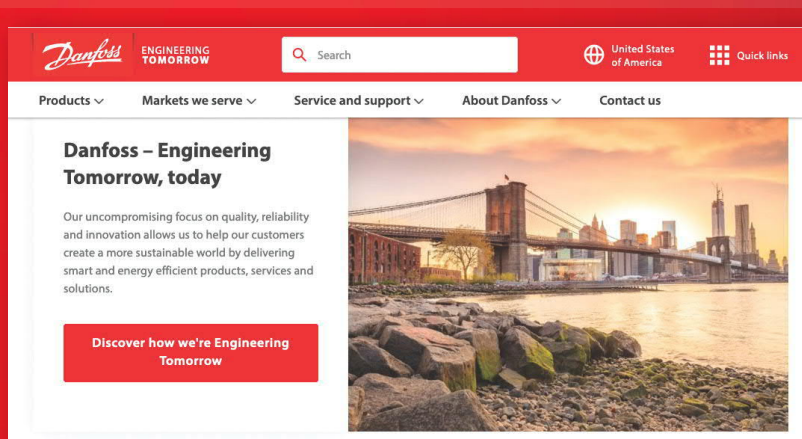
We play an active role in the main growth themes in a world that is rapidly changing. **Infrastructure, food, energy and climate** are the focus of our business. Cities for millions that touch the sky. A richer harvest to feed a growing world. Keeping food fresh and our children warm in a world that can make more out of less. This is how we are Engineering Tomorrow.

Danfoss engineers technologies that enable the world of tomorrow to do more with less. We meet the growing need for infrastructure, food supply, energy efficiency and climate-friendly solutions. Our products and services are used in areas such as refrigeration, air conditioning, heating, motor control and mobile machinery. We are also active in the field of renewable energy as well as district heating infrastructure for cities and urban communities. Our innovative engineering dates back to 1933 and today Danfoss is a world-leader, employing 22,500 employees and serving customers in more than 100 countries. We are still privately held by the founding family.

To find out more about Danfoss and how we are Engineering Tomorrow, visit: www.danfoss.com

**Danfoss North America
Refrigeration & Air-Conditioning**
11655 Crossroads Circle
Baltimore, MD 21220-2863
Phone: (410) 931-8250
Fax: (410) 931-8256

www.danfoss.us/Industrial_Refrigeration



Danfoss shall not be responsible for any errors in catalogs, brochures, or other printed material. Danfoss reserves the right to alter its products at any time without notice, provided that alterations to products already on order shall not require material changes in specifications previously agreed upon by Danfoss and the Purchaser. All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.

AT367381767593en-010101

©Danfoss 01.2021