

HP Combi

Smart  Flow  Plus 
solutions to meet your needs

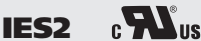


HP Combi is a **highly efficient motor-drive package** that combines a **PM (permanent magnet) synchronous motor with the matched VFD (Variable Frequency Drive)**, achieving very **High Efficiency** levels.

The motor range leverages both brushless servo motor and AC induction motor technologies, so enhancing the power density and allowing for significant **size and weight reductions up to 50%**.

Several drive configurations are available to cover a wide range of industrial and commercial applications. In fact, HP Combi is targeted to both **variable torque applications**, typically in HVAC, as well as to **constant torque applications** like material handling, air compressors and vacuum pumps.

HP Combi is **Plug & Play**: preconfigured motor-drive solutions designed for easy set up and increased system efficiency.



PLUG & PLAY SOLUTION

HP Combi

solutions to meet your needs



RANGE OVERVIEW

PRODUCT LINE	FEATURES	TORQUE		MAIN APPLICATIONS
		CONSTANT	VARIABLE	
	Smart configuration - Suitable for most applications - Industrial, Pump & Fan modes	✓	✓	- General Industrial - HVAC
	Dedicated control functions for HVAC - Innovative energy saving features - Flexible functionality		✓	Advanced HVAC
	Advanced configuration - Maximum performance, motor control - Built in PLC capability	✓	✓	- Demanding Industrial - Compressors - Vacuum pumps - Material handling

SAVING ENERGY WITH COMBI

Electric motors have a significant impact on the worldwide energy consumption:

→ **up to 75% in industrial application and 40% in commercial application***

Today, a major factor influencing the motor industry is energy efficiency driven by both increasingly demanding legislation and the industry's

greater awareness of environmental responsibility.

Lafert embraces the challenge! With HP Combi, saving energy and reducing costs are possible with three easy steps:

- 1. INCREASED MOTOR EFFICIENCY**
- 2. SPEED CONTROL BY A VFD**
- 3. SYSTEM OPTIMISATION**

2. SPEED CONTROL BY VFD



* Source: International Energy Agency



ADDED VALUES & BENEFITS

**MOTOR-DRIVE SYSTEM FULLY
DIMENSIONED AND CONFIGURED**
according to customer needs

PLUG & PLAY SOLUTION
for a fast and easy set-up

**INCREASED SYSTEM EFFICIENCY
& SHORT PAYBACK TIME**
thanks to speed control and
motor-drive optimisation

**THREE MOTOR-DRIVE
CONFIGURATIONS**
to cover both variable and constant
torque applications



**ADVANCED CONTROL
ELECTRONICS**
PC and mobile tools for easy
commissioning, control and service



ONE SINGLE SOURCE
for both motor and drive



STANDARDS & REGULATIONS

	EFFICIENCY TESTING METHOD	EFFICIENCY CLASSIFICATION	IE CODE				
			IEC STANDARD				
MOTOR	IEC 60034-2-1	IEC 60034-30-2	IE1	IE2	IE3	IE4	IE5
VFD	IEC 61800-9-2:VFD Classification and testing		IE0	IE1	IE2	IE3	IE5
MOTOR + VFD	IEC 61800-9-2:VFD Classification and testing		IES0	IES1	IES2	IES3	IES5



1. INCREASED MOTOR EFFICIENCY

PM (permanent magnet) Synchronous Motors offer improved electrical efficiency when compared to traditional AC motors, achieving **IE4 and IE5 efficiency levels**.

PM technology benefits:

- **HIGH EFFICIENCY ACROSS A WIDE RANGE OF OPERATING SPEEDS**
- **EXCELLENT POWER DENSITY AND TORQUE CAPABILITY**



2. SPEED CONTROL BY VFD

A Variable Frequency Drive (VFD) is used to adjust the speed and torque of motor according to the variable demand of an application.

This results in a **relevant decrease in energy consumption** that leads to a **remarkable improvement in overall process efficiency**.

70% of applications are suitable for speed control. Typical variable torque applications, like **fans, compressors and pumps**, will benefit considerably from speed control:

SPEED REDUCTION OF 20% RESULTS IN UP TO 50% ENERGY REDUCTION



3. SYSTEM OPTIMISATION

The motor-drive system is **fully dimensioned and configured in accordance with the application's needs** and the customer's requirements.

Each motor-drive system is unique and designed for the purpose.

This results in a **PLUG & PLAY solution**, with a wide range of optimised motor-drive configurations for **fast set-up and easy commissioning**.

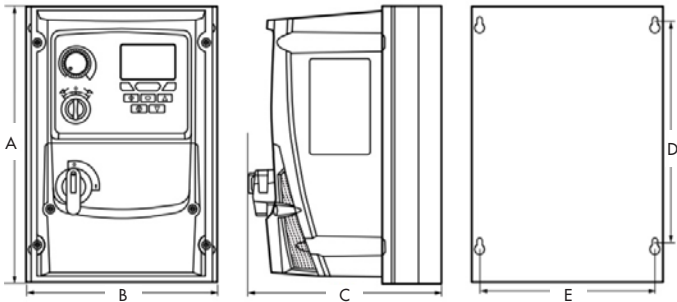
One single source for both system's components, motor and drive, makes this possible!

HPC COMBINATIONS

Package Type	HPS IE5 MOTOR											IP 66					
	Size	Rated Speed	Rated Power	Rated Torque	Peak Torque	Voltage Constant	Torque Constant	Bemf @ rated speed	Rated Current	Efficiency	Weight	IE2 DRIVE			IES2 COMBI		
												Smart	Flow	Plus	Smart	Flow	Plus
		n [rpm]	Pn [kW]	Mn [Nm]	Mpk [Nm]	ke [Vs]	kt [Nm/A]	En [Vrs]	In [Arms]	η [%]	[kg]	Size	Size	Size	η [%]	η [%]	η [%]
HPC 56	56	1800	0.18	1.0	2.9	1.45	2.5	272	0.4	76.3	3.0	1	2	2	74.7	75.4	74.0
	56	1800	0.25	1.3	4.0	1.45	2.5	272	0.5	79.3	3.2	1	2	2	77.6	78.3	76.9
HPC 71	71	1800	0.55	2.9	8.8	1.45	2.5	272	1.2	85.0	5.0	1	2	2	83.1	83.8	82.5
	71	1800	0.75	4.0	11.9	1.45	2.5	272	1.6	86.7	5.4	1	2	2	84.8	85.6	84.0
	71	1800	1.1	5.8	17.5	1.45	2.5	272	2.3	88.1	7.0	2	2	2	87.1	87.4	87.0
	71	1800	1.5	8.0	23.9	1.45	2.5	272	3.2	89.1	7.0	2	2	2	88.0	88.9	88.0
HPC 90	90 S-L	1800	1.5	8.0	23.9	1.45	2.5	272	3.2	89.1	12	2	2	2	88.7	88.9	88.0
	90 S-L	1800	2.2	11.7	35.0	1.45	2.5	272	4.6	90.2	14	2	2	2	89.9	89.6	89.0
	90 S-L	1800	3	15.9	47.7	1.45	2.5	272	6.3	91.0	17	2	2	2	90.6	90.3	90.4
	90 XL	1800	4	21.2	63.7	1.45	2.5	272	8.4	91.8	18	2	2	2	91.4	90.9	90.8
HPC 112	112 M	1800	4	21.2	63.7	1.45	2.5	272	8.4	91.8	23	2	2	2	91.4	90.9	90.8
	112 M	1800	5.5	29.2	87.5	1.45	2.5	272	11.6	92.5	23	3	3	3	92.1	92.4	91.6
	112 M	1800	7.5	39.8	119.4	1.45	2.5	272	15.8	93.2	30	3	3	3	92.9	92.9	92.2
	112 XL	1800	11	58.4	175.1	1.45	2.5	272	23.2	93.5	33	3	3	3	93.5	92.9	92.5
HPC 132	132 M	1800	11	58.4	175.1	1.45	2.5	272	23.2	93.8	54	3	3	3	93.8	93.2	92.7
	132 XXL	1800	15	79.6	238.7	1.45	2.5	272	31.7	94.4	58	4	4	4	94.7	93.9	93.4
	132 XXL	1800	18.5	98.1	294.4	1.45	2.5	272	39.1	94.6	65	4	4	4	94.8	94.6	93.5
HPC 160	160 M	1800	11	58.0	146	1.45	2.5	272	23.2	93.8	70	3	3	3	93.8	93.2	92.7
	160 M	1800	15	80.0	199	1.45	2.5	272	31.7	94.4	75	4	4	4	94.7	93.9	93.4
	160 M	1800	18.5	98.0	245	1.45	2.5	272	39.1	94.6	75	4	4	4	94.8	94.6	93.5
	160 L	1800	22	117.0	292	1.45	2.5	272	46.5	94.9	85	4	4	4	95.1	94.9	94.9
	160 L	1800	30	159.0	398	1.45	2.5	272	63.4	95.3	100	NA	5	5	NA	95.4	95.2
HPC 56	56	3600	0.25	0.7	2	0.73	1.26	272	0.5	75.8	2.8	1	2	2	74.2	74.9	73.4
	56	3600	0.37	1.0	2.9	0.73	1.26	272	0.8	79.5	3.0	1	2	2	77.8	78.5	77.0
	56	3600	0.55	1.5	4.4	0.73	1.26	272	1.2	82.7	3.2	1	2	2	80.9	81.2	80.1
HPC 71	71	3600	0.75	2.0	6	0.73	1.26	272	1.6	84.6	4.8	1	2	2	82.7	83.0	81.8
	71	3600	1.1	2.9	8.8	0.73	1.26	272	2.3	86.2	6.0	2	2	2	85.1	85.7	85.0
	71	3600	1.5	4.0	11.9	0.73	1.26	272	3.2	87.4	6.0	2	2	2	85.9	86.2	86.0
	71	3600	2.2	5.8	17.5	0.73	1.26	272	4.6	88.9	6.6	2	2	2	88.0	87.9	87.6
HPC 90	90 S-L	3600	2.2	5.8	17.5	0.73	1.26	272	4.6	88.9	10	2	2	2	88.0	87.9	87.6
	90 S-L	3600	3	8.0	23.9	0.73	1.26	272	6.3	89.9	12	2	2	2	89.0	88.8	88.8
	90 S-L	3600	4	10.6	31.8	0.73	1.26	272	8.4	90.7	14	2	2	2	89.6	89.7	90.0
	90 S-L	3600	5.5	14.6	43.8	0.73	1.26	272	11.6	91.6	16	3	2	3	90.6	90.8	90.7
HPC 112	112 M	3600	5.5	14.6	46.8	0.73	1.26	272	11.6	91.6	23	3	2	3	90.6	90.8	90.7
	112 M	3600	7.5	19.9	59.7	0.73	1.26	272	15.8	92.4	26	3	3	3	91.3	91.1	91.5
	112 M	3600	11	29.2	87.5	0.73	1.26	272	23.2	93.2	30	3	3	3	92.3	91.8	92.1
	112 M	3600	15	39.8	119.4	0.73	1.26	272	31.7	93.7	33	4	3	4	93.5	92.1	92.7
HPC 132	132 M	3600	15	39.8	119.4	0.73	1.26	272	31.7	93.7	55	4	3	4	93.5	92.1	92.7
	132 XL	3600	18.5	49.1	147.2	0.73	1.26	272	39.1	94.2	59	4	4	4	93.9	93.6	92.9
	132 XXL	3600	22	58.4	175.1	0.73	1.26	272	46.5	94.4	67	4	4	4	94.0	93.6	93.6
	132 XXL	3600	30	79.6	238.7	0.73	1.26	272	63.4	94.9	72	NA	5	5	NA	94.3	93.9
HPC 160	160 L	3600	30	79.6	199	0.73	1.26	272	62.9	94.9	85	NA	5	5	NA	94.3	93.9
	160 L	3600	37	98.0	245	0.73	1.26	272	77.6	95.2	90	NA	5	5	NA	94.5	94.2

DRIVE DIMENSIONS - IP 66

Size	A	B	C	D	E	Bolt	Kg	
							Smart	Flow & Plus
1	232	161	162	189	148.5	M4	2.3	NA
2	257	188	182	200	178	M4	3.5	4.8
3	310	211	235	252	197	M4	6.6	7.7
4	360	240	271	300	227	M4	9.5	9.5
5*	540	235	270	520	175	M8	NA	23



*IP 55 only

HPC COMBINATIONS

Package Type	HPS IE5 MOTOR			IP 20					
	Size	Rated Speed	Rated Power	IE2 DRIVE			IES2 COMBI		
				Smart	Flow	Plus	Smart	Flow	Plus
		n [rpm]	Pn [kW]	Size	Size	Size	η [%]	η [%]	η [%]
HPC 56	56	1800	0.18	1	2	2	73.8	71.3	71.3
	56	1800	0.25	1	2	2	77.3	75.4	75.4
HPC 71	71	1800	0.55	1	2	2	82.9	83.2	82.2
	71	1800	0.75	1	2	2	84.5	85.1	83.7
	71	1800	1.1	2	2	2	85.9	86.1	85.8
	71	1800	1.5	2	2	2	87.1	87.6	87.2
HPC 90	90 S-L	1800	1.5	2	2	2	87.1	87.6	87.5
	90 S-L	1800	2.2	2	2	2	88.8	88.8	88.6
	90 S-L	1800	3	2	2	2	88.7	89.2	88.6
	90 XL	1800	4	2	2	2	90.9	90.4	90.1
HPC 112	112 M	1800	4	2	2	2	91.1	90.4	90.3
	112 M	1800	5.5	3	3	3	91.8	91.9	91.3
	112 M	1800	7.5	3	3	3	92.7	92.5	91.9
	112 XL	1800	11	3	3	3	93.1	92.4	92.3
HPC 132	132 M	1800	11	3	3	3	93.4	92.9	92.3
	132 XXL	1800	15	4	4	4	92.6	92.5	92.3
	132 XXL	1800	18.5	4	4	4	94.1	94.2	93.2
HPC 160	160 M	1800	11	3	3	3	93.5	93.1	92.4
	160 M	1800	15	4	4	4	94.5	93.5	93.3
	160 M	1800	18.5	4	4	4	92.6	92.6	92.5
	160 L	1800	22	4	4	4	94.8	94.4	94.4
	160 L	1800	30	5	5	5	NA	93.4	93.0
HPC 56	56	3600	0.25	1	2	2	74.0	74.2	73.3
	56	3600	0.37	1	2	2	77.4	77.8	77.1
	56	3600	0.55	1	2	2	80.5	81.0	80.1
HPC 71	71	3600	0.75	1	2	2	82.3	82.6	81.5
	71	3600	1.1	2	2	2	84.7	85.4	84.8
	71	3600	1.5	2	2	2	85.5	86.0	85.9
	71	3600	2.2	2	2	2	87.5	87.5	87.3
HPC 90	90 S-L	3600	2.2	2	2	2	87.7	87.5	87.2
	90 S-L	3600	3	2	2	2	88.7	88.5	88.4
	90 S-L	3600	4	2	2	2	89.1	89.3	89.7
	90 S-L	3600	5.5	3	2	3	90.2	90.4	90.5
HPC 112	112 M	3600	5.5	3	2	3	90.1	90.4	90.2
	112 M	3600	7.5	3	3	3	90.6	90.7	90.9
	112 M	3600	11	3	3	3	91.9	91.5	92.4
	112 M	3600	15	4	4	4	93.2	91.8	92.6
HPC 132	132 M	3600	15	4	4	4	93.2	92.0	92.5
	132 XL	3600	18.5	4	4	4	93.3	93.1	92.7
	132 XXL	3600	22	4	4	4	93.6	93.5	93.5
	132 XXL	3600	30	5	5	5	NA	94.1	93.8
HPC 160	160 L	3600	30	5	5	5	NA	93.9	93.6
	160 L	3600	37	5	5	5	NA	94.2	94.1

HPS MOTOR RANGE

IE5 IP55 c  US

- **Power rating: 0.37kW to 37kW**
0.50HP to 50HP
- Torque: 2 Nm to 190 Nm
- Speed: up to 4500 rpm
- Frame size: 56, 71, 90, 112, 132, 160
- **Design flexibility**
- IEC mechanical configurations (B14, B5,...)
- NEMA mounting
- **IPM (Interior PM) or SMPM (Surface Mounted PM) motor design** depending the performance demand
- **Ultra Premium Efficiency – IE5**
- Degree of protection IP55 as standard
- Size and weight reduction **up to 50%**

DRIVE RANGE

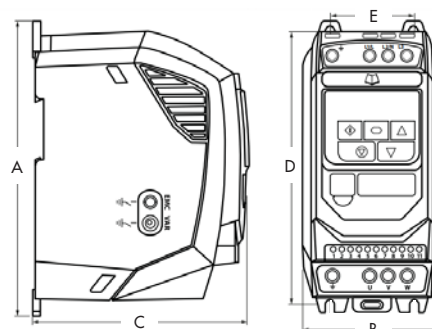
IE2 IP66 IP20

- **Power rating: 0.37kW to 37kW**
0.50HP to 50HP
- **IP66 / NEMA 4X Outdoor**
- **Decentralised drive solution** to be mounted closed to the motor
- Conformally coated electronics for harsh environments
- **High Efficiency - IE2**
- **Dedicated PM motor vector control**
- Three drive lines to satisfy any application requirements
- PC tool and mobile app for easy set-up

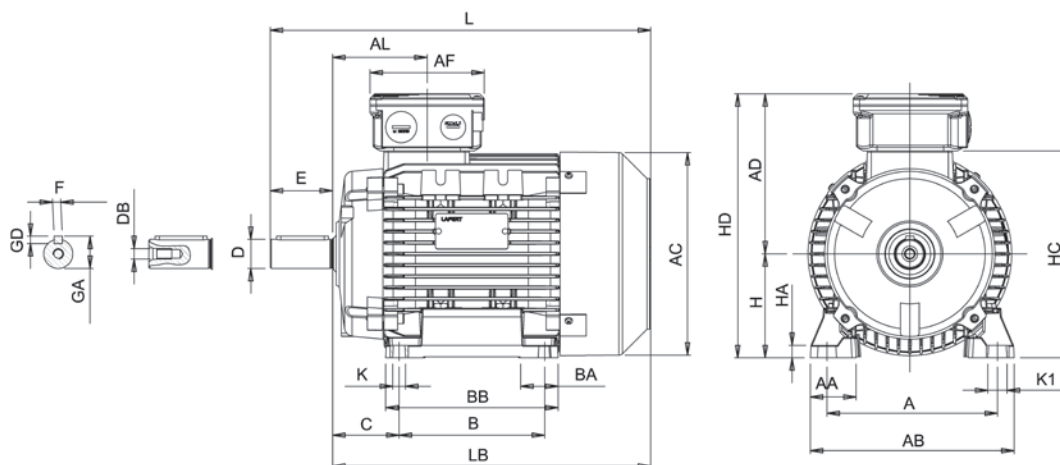
HP Drive 
TOOLS

DRIVE DIMENSIONS - IP 20

Size	A	B	C	D	E	Bolt	Kg	
							Smart	Flow & Plus
1	173	83	123	162	50	4xM5	1.0	NA
2	221	110	150	209	63	4xM5	1.7	1.8
3	261	131	175	247	80	4xM5	3.2	3.5
4	420	171	212	400	125	4xM8	9.1	10.4
5	486	222	226	463	175	4xM8	18.1	19.9



MOTOR DIMENSIONS



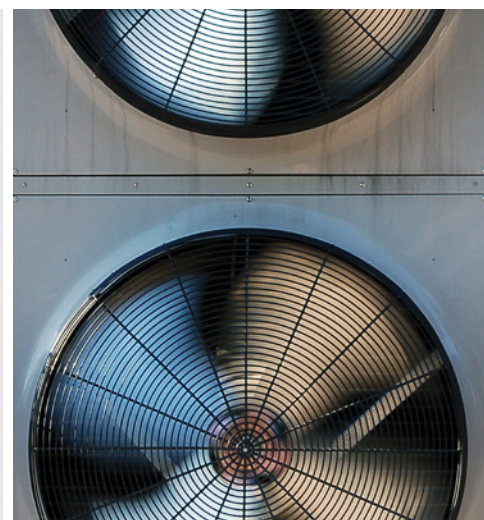
IEC	H	A	B	C	K ⁽¹⁾	AB	BB	AD ⁽²⁾	HD ⁽²⁾	AC	HC	HA
56	56	90	71	36	6	107	86	92	148	110	109	8
71	71	112	90	45	8	135	108	114	185	142	142	9
90S	90	140	100	56	10	170	150	148	238	177	181	11
90L	90	140	125	56	10	170	150	148	238	177	181	11
90XL	90	140	125	56	10	170	150	148	238	177	181	11
112M	112	190	140	70	12.5	220	176	171	283	225	226	15
112XL	112	190	140	70	12.5	220	176	171	283	225	226	15
132M	132	216	178	89	12	256	218	195	327	248	261	17
132XL	132	216	178	89	12	256	218	195	327	248	261	17
132XXL	132	216	178	89	12	256	218	195	327	248	261	17
160M	160	254	210	108	14	320	270	238	398	317	316	23
160L	160	254	254	108	14	320	310	238	398	317	316	23

IEC	K1	L	LB	AL	AF	BA	AA	D	E	F	GD	GA	DB ⁽³⁾
56	9	188	168	61	93	27	27	14	30	5	5	16	M5
71	17	242	215	75	93	22	30	19	40	6	6	22	M6
90S	15	317	267	85	110	28/53	37	24	50	8	7	27	M8
90L	15	317	267	85	110	28/53	37	24	50	8	7	27	M8
90XL	15	340	290	85	110	28/53	37	24	50	8	7	27	M8
112M	19	388	328	92	110	46	48	28	60	8	7	31	M10
112XL	19	410	350	92	110	46	48	28	60	8	7	31	M10
132M	20	485	405	122	133	45	59	38	80	10	8	41	M12
132XL	20	505	425	122	133	45	59	38	80	10	8	41	M12
132XXL	20	556	476	122	133	45	59	38	80	10	8	41	M12
160M	18	608	498	146	150	65	76	42*	110	12*	8*	45*	M16
160L	18	652	542	168	150	65	76	48	110	14	9	51.5	M16

1) Clearance hole for screw

2) Maximum distance

3) Centering holes in shaft extensions to DIN 332 part 2



VARIABLE FREQUENCY DRIVE (VFD) | SPECIFICATIONS



MAIN SUPPLY

Supply Frequency	48-62 Hz	48-62Hz	48-62Hz
Three-phase Supply Voltage	200-240 V ± 10%	200-240 V ± 10%	200-240 V ± 10%
	380-480 V ± 10%	380-480 V ± 10%	380-480 V ± 10%
		500-600 V ± 10%	500-600 V ± 10%

OUTPUT RATINGS

Power Ratings	Up to 22 kW	Up to 37 kW	Up to 37 kW
Overload Capacity	150% for 60 seconds	110% for 60 seconds	150% for 60 seconds
	175% for 2.5 seconds	165% for 4 seconds	200% for 4 seconds

PROGRAMMABLE INPUTS

2 Digital	3 Digital (+3 optional)	3 Digital (+3 optional)
2 Analog / Digital selectable	2 Analog / Digital selectable	2 Analog / Digital selectable

PROGRAMMABLE OUTPUTS

1 Analog / Digital	2 Analog / Digital	2 Analog / Digital
1 Relay	2 Relays (+3 optional)	2 Relays (+3 optional)

BUILT IN FIELDBUS

CANopen	BACnet MS/TP	CANopen
Modbus RTU	Modbus RTU	Modbus RTU
Other options available	Other options available	Other options available

INTERNAL EMC FILTER

✓	✓*	✓*
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INTERNAL BRAKE TRANSISTOR

✓**		✓
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BUILT-IN KEYPAD

✓	✓	✓
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DISPLAY

7 segment LED	TFT multi-language text	TFT multi-language text
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ENCLOSURE

Switched or non-switched	With or without disconnecter	Switched or non-switched
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PI(D) CONTROL

Internal PI controller	Internal PID controller	Internal PID controller
Standby / sleep function	STO function	STO function
	Programmable PLC	Programmable PLC
	Multi setpoint select	Multi setpoint select
	Standby / sleep function	Standby / sleep function

* Not available for 500-600V drives

** Not available in size 1

VARIABLE FREQUENCY DRIVE (VFD) | OPTIONS

TYPE	DESCRIPTION	Smart	Flow	Plus+
COMMUNICATION INTERFACES	EtherCAT Plug in Interface Module		✓	✓
	Profibus DPV-1 Plug in Interface Module		✓	✓
	Profinet IO Plug in Interface Module		✓	✓
	EthernetIP Plug in Interface Module		✓	✓
	DeviceNet Plug in Interface Module		✓	✓
	Bacnet IP Plug in Interface		✓	
	Modbus TCP Plug in Interface Module		✓	✓
	Profibus External Gateway & Cables	✓	✓	✓
	DeviceNET External Gateway & Cables	✓	✓	✓
	EtherNet Module	✓	✓	✓

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