Industrial Motors

Commercial & Appliance Motors

Automation

Digital & Systems

Energy

Transmission & Distribution

Coatings

ADP200 INVERTER FOR SERVOPUMP

Performance and energy saving



Driving efficiency and sustainability



SUMMARY

Applications

Performing hydraulic drive machines

Special functions for servopump

Description

General characteristics

Input/output data

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Software







Applications





molding machines







Hydraulic bending machines

Wec

Performing hydraulic drive machines

Hydraulic drive machines are a perfect combination of hydraulic system and AC servo drive technology.

WEG's ADP200 is the right solution for servopump control, providing precise pressure and flow control and avoiding the energy waste typical of traditional hydraulic systems.

Oil flow and pressure can be set exactly as required by the machine, rather than at higher levels, without discharging oil as in conventional hydraulic machines.

The ADP200 high-performance drive is perfectly in line with the innovative "green manufacturing" design of injection molding machines, creating real added value for customers in terms of energy efficiency and higher mold quality.

WEG's specific PID algorithm manages both single servopump systems and multi-pump machines and covers a wide range of applications.

Eco-friendly

Energy saving by:

- Using high-end servo systems
- Reducing heat in hydraulic fluid
- Low CO₂ emissions

High precision

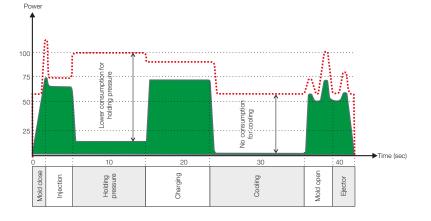
Great performing pressure and speed control.

High repeatability

Advanced features of servo motor closed loop control.

Low noise

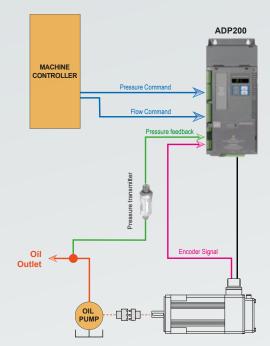
Quiet technological operation for a better working environment.





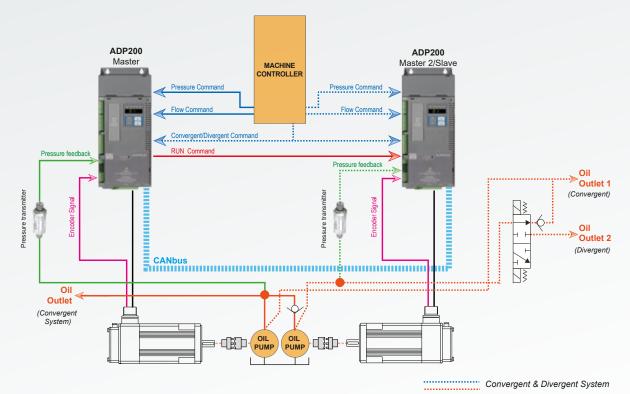
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Single hydraulic pump control



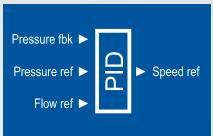
ADP200 has a built-in dedicated PID function for efficient and high performing pump control both for single and multi pump machines:

Multi hydraulic pump control: convergent system and convergent & divergent system



Special functions for servopump

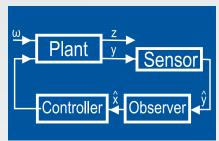
PID function block for IMM



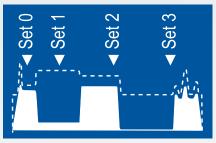
Pressure oscillation damping



Adaptive feedforward



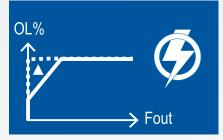
Multi level PID



Pump protection



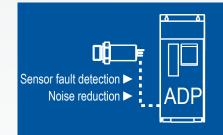
200% overload @ 0 Hz



Speed and pressure control loops tuning



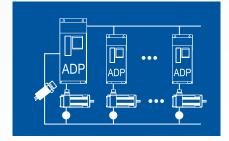
Dedicated pressure sensor input



Automatic switchover between speed and pressure control



Multipump systems



Suitability for new machines and revamping





Description

The new ADP200 inverter series represents an innovative concept in drive technology, the result of constant technological research and the know-how in plastics and metal applications that the WEG Group has acquired by working side by side with major sector players.

This new series has been engineered and developed to satisfy the real needs of plastics machine manufacturers and to provide them the best and most economically competitive innovations on international markets.

Based on full mechanical modularity, a powerful and "fully open" programming platform, and a specific PID algorithm for servo-pump control, the ADP200 offers completely flexible integration and high performance for plastics applications.



Power range

Madala	Power (kW)										
Models	7.5	11	15	18.5	22	30	37	45	55	75	
ADP200	Size 2		Size 3			Size 4			Sizes 5 and 5S		

Drive type designation

ADP200	-X	XXX	-K	В	Р	-F	-4	-C	-RS	-ER	-24	-IO1		
													I/O card version:	
													[Empty] = standard I/O card EXP-IO-D8A4R2-A	DP
													24 V dc external power supply:	
													24 = included	
													Encoder repetition:	
													ER = with encoder repetition	
													[Empty] = not included	
													Encoder card:	
													RS = Resolver (standard)	DE = Digital encoder
													ED = EnDat	HI = Hiperface
													SE = Sinusoidal encoder	SC = Sinusoidal SinCos encoder
													CANbus:	
													C = included	
													Rated voltage:	
													4 = 400 V ac, 3 ph	
													EMI filter:	
													F = included	
													[empty] = not included	
													PID IMM application:	
													P = included	
													Braking unit:	
													B = included	
													X = not included	
													Keypad:	
													K = integrated (1-line x 4 characters alphanum	erical LED display)
													Drive power, in kW:	000 00.111
													075 = 7.5 kW	300 = 30 kW
													110 = 11 kW 150 = 15 kW	370 = 37 kW 450 = 45 kW
													150 = 15 KW 185 = 18.5 kW	450 = 45 KW 550 = 55 kW
													220 = 22 kW	750 = 55 kW 750 = 75 kW
													Mechanical drive sizes: 2, 3, 4, 5, 5S	150 – 15 KW
													Servodrive, ADP200 series	

Weights and dimensions

Circo	Dimensions: Widt	h x Height x Depth	Weight		
Sizes	mm	inches	kg	lbs	
ADP200-2	162 x 396 x 159	6.38 x 15.59 x 6.26	7.8	17.2	
ADP200-3	235 x 401 x 179.4	9.25 x 15.79 x 7.06	10.5	23.5	
ADP200-4	267.6 x 616 x 276	10.53 x 24.25 x 10.87	32	70.6	
ADP200-5550	311 x 767 x 331.4	12.2 x 30.2 x 13.05	60	132.3	
ADP200-5750	311 x 784 x 332.8	12.2 x 30.8 x 13.1	60	132.3	
ADP200-5S	300 x 630 x 332	11.8 x 24.8 x 13.07	42	92.6	

General characteristics

Notes: 1) Speed control accuracy may vary depending on motor type and installation condition. 2) For use and connection of available AC and DC external optional choke, refer to the instruction manual.

	Motor protection	Compatibility with KTY, PTC or Klixon						
<u>د</u>	Ground leakage current	Setting via parameter						
Protections	Voltage protection	Overvoltage threshold: 820 V dc Undervoltage threshold: 225 V dc (@230 V ac), 391 V dc (@400 V ac), 450 V dc (@460 V ac), 470 V dc (@480 V ac)						
노	Mains input over-voltage	Varistor						
	Over-temperature	Built in temperature sensor						
	Port for SD card	Yes						
Other	Functions	 Self-tuning rotational and stand still of speed-current-flux regulators and motor data identification Torque control Simplified start-up menu Motor, drive and braking resistor l²t thermal protection Multi speed function (16 programmable preset) A daptive feedforward Automatic switchover between closed-loop speed and pressure control Speed and pressure control loops tuning Doop function Droop function Double parameters setting Variable switching frequency Motor temperature monitoring 						
а	Immunity/emissions	In compliance with EN 61800-3. Conducted emission C2 up to 11 kW and C3 with "F" configuration (External filter available for standard version, no filter inside)						
nent ions	Climatic conditions	EN 60721-3-3						
Environmental conditions	Protection class	IP20						
Envi	Cooling system	Forced-air						
	Operating temperature	-1040 °C (14°104 °F), +40 °C+50 °C (+104+122 °F) with derating						
	Altitude	Max 2,000 m (up to 1,000 m without derating)						
Markings	CE	Complies with the EC Directive concerning low voltage equipment (Directives LVD 2014/35/EC, EMC 2014/30/EC)						
Mark	cUus	UL 508C						



General characteristics

I/O configuration

The ADP200 inverter features a new I/O card, as standard, specially developed to configure standard applications and to limit costs; optional card can be supplied on request for specific requirements:

Standard: EXP-IO-D8A4R2-ADP

- 1 enable input (Enable)
- 6 digital inputs (DI)
- 2 digital outputs (DO)
- 3 differential analog inputs (Al):
 - 1 for pressure sensor:
 - Voltage: 0...10 V or 0.1...10.1 V (3 wires)
 - Current: 0...20 mA or 4...20 mA (2 wires)
 - 2 for flow/pressure references or general purpose:
 - Voltage: ±10 V
 - Current: 0...20 mA or 4...20 mA
- 1 analog output (AO):
 - Voltage: 0...10 V
- Current: 0...20 mA or 4...20 mA
- 2 relay outputs (RO)
- 1 motor protection input (compatible with PTC, KTY, Klixon)



SD card

The SD memory card makes it very simple to save and load data and configurations with the ADP200.

Encoder configuration

The ADP200 interfaces with all main feedback devices for field-oriented vector control (FOC) of synchronous motors:

Standard: EXP-RES-I1-ADP

- Resolver
- Excitation frequency: from 2.0 to 10 kHz
- Transformation ratio: from 0.1 to 1.0

Optional cards¹⁾

- EXP-RES-I1R1-ADP, Resolver + Repeat
- EXP-DE-I1R1F2-ADL, Incremental Digital encoder + Repeat + 2 Freeze
- EXP-SE-I1R1F2-ADL, Incremental Sinusoidal encoder + Repeat + 2 Freeze
- EXP-SESC-I1R1F2-ADL, Incremental Sinusoidal + SinCos encoder + Repeat + 2 Freeze.
- EXP-EN/SSI-I1R1F2-ADL, Incremental Sinusoidal + Absolute EnDat/SSI encoder + Repeat + 2 Freeze
- EXP-HIP-I1R1F2-ADL, Incremental Sinusoidal + Hiperface encoder + Repeat + 2 Freeze

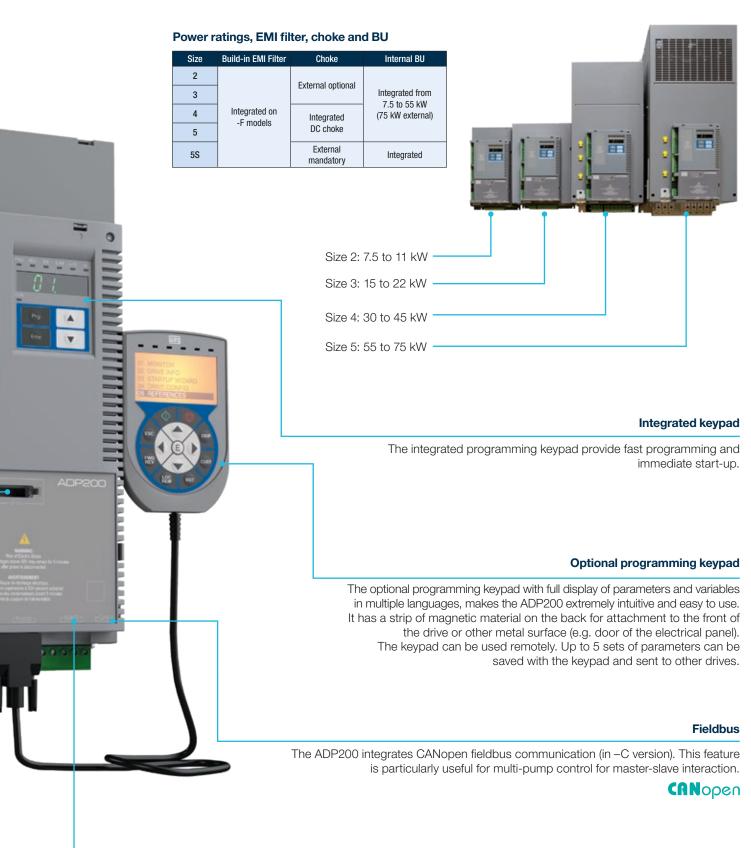
Note: 1) Specify desired drive configuration if it is different than standard drive configuration.

24 V dc

Regulation card external power supply



III E T



Serial communication

The ADP200 integrates a standard RS485 serial line with Modbus-RTU protocol, for peer-to-peer or multidrop connections (with OPT-RS485-ADP).

Modbus

Input/output data

The combinations listed in the table show the current that can be delivered by the drive during continuous operation and overload conditions, according to the mains voltage.

The same engineering criteria apply for operations with additional derating factors (see drive instruction manual).

			Input	data						Output data			
Sizes		AC inpu	it current for	n continuous op ms]	eration		Inverter output	Pn mot l2n (recommended synchronous motor rating, fsw = default) (for synchronous mot					
Sizes	@ 23	0 V ac	@ 40	0 V ac	@ 48	0 V ac		@ 000 V oo	@ 400 V aa	@ 460 V aa	@ 020 V aa	@ 400 V ac	@ 460 V cc
	Without input choke	With input choke ¹⁾	Without input choke	With input choke ¹⁾	Without input choke	With input choke ¹⁾	[kVA]	@ 230 V ac [kW]	@ 400 V ac [kW]	@ 460 V ac [HP]	[A]	[A]	@ 460 V ac [A]
2075	24	20	24	20	21	19	13	4	7.5	10	18.5	18.5	16.7
2110	28	24	28	25	25	24	15	5.5	11	15	22	22	19.8
3150	40	34	40	35	35	33	22	7.5	15	20	32	32	28.8
3185	48	42	48	44	43	41	27	9	18.5	25	39	39	35.1
3220	51	45	51	47	46	44	29	11	22	30	42	42	37.8
4300	64	-	65	-	61	-	42	15	30	40	60	60	54
4370	79	-	80	-	75	-	52	18.5	37	50	75	75	67.5
4450	96	-	99	-	93	-	62	22.0	45	60	90	90	81
5550	112	-	116	-	109	-	73	30	55	75	105	105	94
5750	158	-	161	-	148	-	104	37	75	100	150	150	135
5S550 ²⁾	-	113	-	120	-	114	73	30	55	75	105	105	94
5S570 ²⁾	-	158	-	161	-	148	104	37	75	100	150	150	135

Notes: 1) ADP200-4300...5750 models have DC side choke integrated. For use and connection of available external optional chokes, refer to the instruction manual. 2) ADP200-5S550 and 5S750 models: AC input external choke is mandatory.

Sizes	Swite frequen		F	Reduction facto	tor		Sizes	Switching frequency fsw ¹⁾		Reduction factor		
51265	Max [kHz]	Default [kHz]	Kt ²⁾	Kalt ³⁾	Kv ⁴⁾		51285	Max [kHz]	Default [kHz]	Kt ²⁾	Kalt ³⁾	Kv ⁴⁾
2075	8	4	0.9	1.2	0.9		4300	8	4	0.9	1.2	0.9
2110	8	4	0.9	1.2	0.9		4370	8	4	0.9	1.2	0.9
3150	8	4	0.9	1.2	0.9		4450	8	4	0.9	1.2	0.9
3185	8	4	0.9	1.2	0.9		5550-58550	8	4	0.9	1.2	0.9
3220	8	4	0.9	1.2	0.9		5750-58570	8	4	0.9	1.2	0.9

Notes: 1) The switching frequency is set by default to a fixed value. The dynamic switching frequency can be set by parameter.

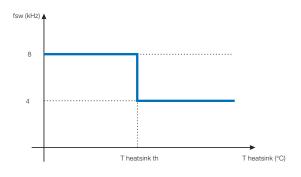
2) Kt: derating factor with an ambient temperature of 50 °C (1% every °C above 40 °C). 3) Kalt: derating factor for installation at altitudes above 1,000 meters a.s.l. Value to be applied = 1.2% each 100 m increase above 1,000 m (up to a maximum of 3,000 m).

For example: altitude 2,000 m, Kalt = 1.2% * 10 = 12% derating; In derated = 100 - ((12*100)/100) = 88% In.

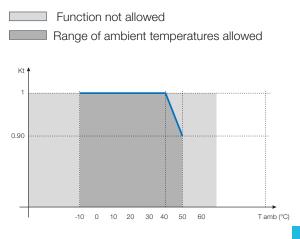
4) Kv: derating factor for mains voltage at 460 V ac.

Derating values for switching frequency

In dynamic mode, the switching frequency is modified according to the temperature of the drive (measured on the heat sink), as shown in the figure below.



Ambient temperature reduction factor



Drive models & codes

Supply 3 x 400 V ac

- Internal LED keypad
- Integrated CANBus
- Integrated Resolver card
- Optional programming keypad
- Standards card on board:
 - I/O = 6DI + Enable) + 2DO + 3AI + 1AO + 2RO + 1 motor protection
 - Transducer = Resolver



Model	Cod.	Pn@ 400 V ac Sync. motor	Configuration
ADP200-2075-KBP-4-C-RS-24	S9ADP51	7.5 kW	Internal braking unit – Without EMI filter
ADP200-2110-KBP-4-C-RS-24	S9ADP52	11 kW	Internal braking unit – Without EMI filter
ADP200-3150-KBP-4-C-RS-24	S9ADP53	15 kW	Internal braking unit – Without EMI filter
ADP200-3185-KBP-4-C-RS-24	S9ADP54	18.5 kW	Internal braking unit – Without EMI filter
ADP200-3220-KBP-4-C-RS-24	S9ADP55	22 kW	Internal braking unit – Without EMI filter
ADP200-4300-KBP-4-C-RS-24	S9ADP56	30 kW	Internal braking unit – Without EMI filter - Integrated DC choke
ADP200-4370-KBP-4-C-RS-24	S9ADP57	37 kW	Internal braking unit – Without EMI filter - Integrated DC choke
ADP200-4450-KBP-4-C-RS-24	S9ADP58	45 kW	Internal braking unit – Without EMI filter - Integrated DC choke
ADP200-5550-KBP-4-C-RS-24	S9ADP59	55 kW	Internal braking unit – Without EMI filter - Integrated DC choke
ADP200-5750-KXP-4-C-RS-24	S9ADP60	75 kW	Without EMI filter - Integrated DC choke
ADP200-5S550-KBP-4-C-RS-24	S9ADP63	55 kW	Internal braking unit – Without EMI filter - Compact size
ADP200-5S750-KBP-4-C-RS-24	S9ADP64	75 kW	Internal braking unit - Without EMI filter - Compact size
ADP200-2075-KBP-F-4-C-RS-24	S9ADP11	7.5 kW	Internal braking unit – EMI filter integrated
ADP200-2110-KBP-F-4-C-RS-24	S9ADP12	11 kW	Internal braking unit – EMI filter integrated
ADP200-3150-KBP-F-4-C-RS-24	S9ADP13	15 kW	Internal braking unit – EMI filter integrated
ADP200-3185-KBP-F-4-C-RS-24	S9ADP14	18.5 kW	Internal braking unit – EMI filter integrated
ADP200-3220-KBP-F-4-C-RS-24	S9ADP15	22 kW	Internal braking unit – EMI filter integrated
ADP200-4300-KBP-F-4-C-RS-24	S9ADP16	30 kW	Internal braking unit – EMI filter integrated - Integrated DC choke
ADP200-4370-KBP-F-4-C-RS-24	S9ADP17	37 kW	Internal braking unit – EMI filter integrated - Integrated DC choke
ADP200-4450-KBP-F-4-C-RS-24	S9ADP18	45 kW	Internal braking unit – EMI filter integrated - Integrated DC choke
ADP200-5550-KBP-F-4-C-RS-24	S9ADP19	55 kW	Internal braking unit – EMI filter integrated - Integrated DC choke
ADP200-5750-KXP-F-4-C-RS-24	S9ADP20	75 kW	EMI filter Integrated - Integrated DC choke
ADP200-5S550-KBP-F-4-C-RS-24	S9ADP23	55 kW	Internal braking unit – EMI filter integrated - Compact size
ADP200-5S750-KBP-F-4-C-RS-24	S9ADP24	75 kW	Internal braking unit – EMI filter integrated - Compact size

Options and accessories

AC input choke¹⁾

Models	Cod.	Note	Dimensions: W x H x D mm [inches]	Weight kg [lbs]
LR3y-2075	S7AB6	AC input choke for 7.5 kW	150 [5.9] x 155 [6.1] x 79 [3.1]	4.9 [10.8]
LR3y-3110	S7AB7	AC input choke for 11 kW	150 [5.9] x 155 [6.1] x 79 [3.1]	5 [11]
LR3y-3150	S7AB8	AC input choke for 15 kW	150 [5.9] x 169 [6.7] x 85 [3.3]	5.5 [12.1]
LR3-022	S7FF4	AC input choke for 18.5 kW - 22 kW	180 [7.1] x 182 [7.2] x 130 [5.1]	7.8 [17.2]
LR3-055	S7FF1	AC input choke for 5S550 model	180 [7.1] x 185 [7.3] x 180 [7.1]	12 [26.5]
LR3-090	S7D19	AC input choke for 5S750 model	300 [11.8] x 265 [10.4] x 205 [8.1]	30 [66.1]

Note: ADP200-4300...5750 have integrated DC choke.

Braking resistor¹⁾

3

	Models	Cod.	Note	Dimensions: W x H x D mm [inches]	Weight kg [lbs]
	SRF 600 T 68R	S8SA21	Braking resistor for 7.5 kW	320 [12.6] x 27 [1.06] x 36 [1.42]	0.65 [1.4]
	SRF 600 T 40R	S8SA22	Braking resistor for 11 kW	320 [12.6] x 27 [1.06] x 36 [1.42]	0.65 [1.4]
	SRF 600 T 26R	S8SA17	Braking resistor for 15 kW	300 [11.8] x 30 [1.18] x 35 [1.38]	0.65 [1.4]
	SRF 600 T 18R	S8SA23	Braking resistor for 18.5 kW - 22 kW	320 [12.6] x 27 [1.06] x 35 [1.38]	0.65 [1.4]
-0-	SRF 1K0 T 12R	S8SA18	Braking resistor for 30 kW - 37 kW	320 [12.6] x 100 [3.93] x 30 [1.18]	2.35 [5.2]
	SRF 1K0 T 10R	S8SA19	Braking resistor for 45 kW	320 [12.6] x 100 [3.93] x 30 [1.18]	2.35 [5.2]
	SRF 1K0 T 8R	S8SA20	Braking resistor for 55 kW - 75 kW	320 [12.6] x 100 [3.93] x 30 [1.18]	2.35 [5.2]

External EMI filter (for models without integrated filter)¹⁾

	Models	Cod.	Note	Dimensions: W x H x D mm [inches]	Weight kg [lbs]
	EMI FTF-480-16	S7GH0	External EMI filter for 7.5 kW	250 [9.84] x 45 [1.77] x 70 [2.76]	0.8 [1.8]
CONTRACT OF	EMI FTF 480-30	S7GHP	External EMI filter for 11 kW - 15 kW	270 [10.63] x 50 [1.97] x 85 [3.35]	1 [2.2]
al la	EMI FTF 480-42	S7G0A	External EMI filter for 18.5 kW - 22 kW	310 [12.20] x 50 [1.97] x 85 [3.35]	1.3 [2.9]
	EMI FTF-480-55	S7G0B	External EMI filter for 30 kW	250 [9.84] x 90 [3.54] x 85 [3.35]	1.9 [4.2]
	EMI FTF-480-75	S7G0C	External EMI filter for 37 kW	270 [10.63] x 80 [3.15] x 135 [5.31]	2.6 [5.7]
	EMI FTF-480-100	S7G0D	External EMI filter for 45 kW - 55 kW	270 [10.63] x 90 [3.54] x 150 [5.91]	3 [6.6]
	EMI FTF-480-130	S7G0E	External EMI filter for 75 kW	270 [10.63] x 90 [3.54] x 150 [5.91]	3.6 [7.9]

I/O cards

	Models	Cod.	Note
Contract of the	EXP-IO-D10A3R2-ADP	-	8DI + Enable + 2DO + 3AI + 2RO + 1 motor protection
	EXP-IO-D8A4R2-ADP	-	6DI + Enable + 2D0 + 3AI + 1A0 + 2R0 + 1 motor protection



Notes: 1) These options are specific for injection molding machine application, for other application refer to WEG Commercial Department. EN 61800-3 category C2 (ADP200-2075...3150) and C3 (≥ADP200-3185).

Options and accessories

Models

Kit power shield size 2

Cod.

S726101

Encoder cards



Models	Cod.	Note
EXP-RES-I1-ADP	-	Resolver
EXP-RES-I1R1-ADP	-	Resolver + Repeat
EXP-DE-I1R1F2-ADL	-	Incremental digital encoder + Repeat + 2 Freeze
EXP-SE-I1R1F2-ADL	-	Incremental sinusoidal encoder + Repeat + 2 Freeze
EXP-SESC-I1R1F2-ADL	-	Incremental sinusoidal + SinCos encoder + Repeat + 2 Freeze
EXP-EN/SSI-I1R1F2-ADL	-	Incremental sinusoidal + Abso¬lute EnDat/SSI encoder + Repeat + 2 Freeze
EXP-HIP-I1R1F2-ADL	-	Incremental sinusoidal + Hiperface encoder + Repeat + 2 Freeze

Note

Power cable shielding kit for size 2

Various















Software

WEG_eXpress programming software

Applications

- Configuring parameters of WEG devices (instruments, drives, sensors)
- Tuning control parameters with on-line tests and trends
- Managing parameter archive for multiple configuration

Features

- Guided product selection
- Multiple languages
- Creation and storage of recipes
- Oscilloscope
- Simplified settings
- Parameter printout
- Network autoscan

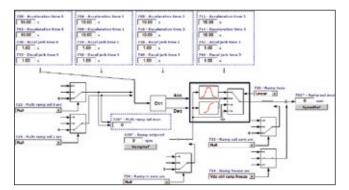


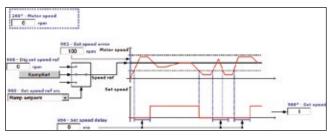
WEG_eXpress software configures the parameters of the automation components, drives and sensors in the WEG catalogue. The graphic interface makes selecting and configuring parameters easy and intuitive. Devices are grouped according to product type and functions.

Products are searched by means of a context search and a display of product photos.

This provides a single device library for all WEG products.

Complete configuration information for every device is given in XML format to facilitate expansion of the catalogue and parameters.





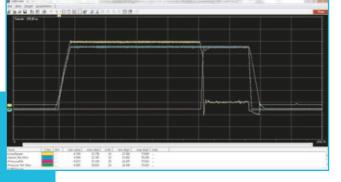
Software

SoftScope

SoftScope is a software oscilloscope with synchronous sampling (buffered with a minimum sampling time of 1ms). With SoftScope, the user can easily and quickly display a number of specific variables, such as commissioning variables, variables for testing performance levels achieved or for tuning control loops, etc.

SoftScope can be used to define the following parameters:

- Trigger conditions (e.g. climbing leading edge of a specific signal)
- Recording quality (a multiple of the basic clock at 1ms)
- Recording duration period
- System sizes to be recorded





Softscope acquisition during injection

Example of pressure tuning

Application PID for hydraulic machine with servopump

Applications

ADP200 has a built-in PID function for both flow and pressure limit control. This SW has been especially optimized for the requirements of the hydraulic machine with single and multi servopump.

The control needs as input the pressure feedback measured from external sensor, the pressure reference and the speed reference. These information are processed to meet typical pattern of the flow (speed) and pressure references during a complete machine cycle.

Features

- Flow and pressure limit control
- Single pump control
- Multi pump convergent control
- Multi pump divergent/convergent control





Global presence is essential, as much as understanding your needs.

Global Presence

With more than 30,000 employees worldwide, WEG is one of the largest electric motors, electronic equipments and systems manufacturers. We are constantly expanding our portfolio of products and services with expertise and market knowledge. We create integrated and customized solutions ranging from innovative products to complete aftersales service.

WEG's know-how guarantees our *ADP200 Inverter for Servopump* is the right choice for your application and business, assuring safety, efficiency and reliability. Availability is to have a global support network
 Partnership is to create solutions that suits your needs
 Competitive edge is to unite technology and inovation





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High performance and reliable products to improve your production process.



Excelence is to provide a whole solution in industrial automation that improves our customers productivity.

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The scope of WEG Group solutions is not limited to products and solutions presented in this catalogue. **To see our portfolio, contact us.**



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