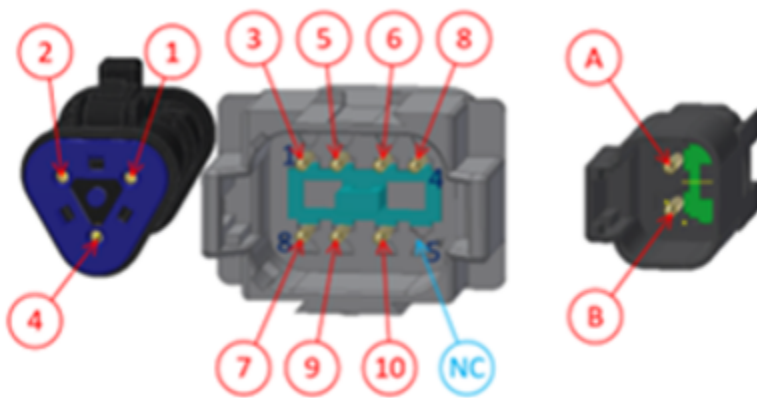


## MED, CAN Technical Specifications

<b>CAN</b>	
Nominal Voltage (Vdc)	<b>12 or 24</b>
Operational Current (A)	<b>(see performance graph)</b>
Operational Torque (Nm)	<b>(see performance graph)</b>
Speed range (rpm)	<b>0-70</b>
Speed Control	<b>CAN FD messaging</b>
Stall Current (A)	<b>35 A at 12 Vdc</b>
Stall Torque (Nm)	<b>40</b>
Transmission ratio	<b>65:1</b>
Frame Size:	
Height, mm (in)	<b>111.6 (4.39)</b>
Length, mm (in)	<b>187.6 (7.39)</b>
Width, mm (in)	<b>87.4 (3.44, no shaft)</b>
Weight, kg (lb)	<b>1.1-1.4 (2.4-3.0)</b>
Gear Wheel Material	<b>Acetal (Delrin)</b>
IP Rating	<b>IP68</b>
Communication	<b>CAN J1939 Baud rate: 250 kbps and CAN FD</b>
Digital I/O	<b>Yes</b>
Outputs	<b>Speed, Direction, Current Draw, Position, ChA., ChB., Home Pulses Counts</b>
Transmission Rate	<b>200ms or higher</b>
Digital Serial Bit Position Output	<b>CAN FD messaging</b>
Analog Signal Voltage Output	<b>CAN FD messaging</b>
Home Position Output	<b>CAN FD messaging</b>
2-Channel Incremental Encoding Output	<b>CAN FD messaging</b>
LIN	<b>No</b>
Diagnostic	<b>(customizable)</b>
Protections	<b>Reverse Polarity, Over-temperature</b>
Encoder Type	<b>Digital encoder, Analog encoder</b>
Resolution (degree)	<b>0.35</b>
Output Type	<b>Analog Output, PWM signal, SPI available via CAN message</b>
Multiple Motor Synchronization	<b>Yes</b>
Mounting Holes BHC (A, see drawing):	
	<b>48.26mm (1.900")</b>
	<b>64.00mm (2.520")</b>
Mounting Bolt Hole Threads (B, see drawing):	
	<b>M6 x 1 - 6H</b>
	<b>¼ - 20 UNC – 2B</b>
Mounting Holes Offset (C, see drawing):	
	<b>0° Offset</b>
	<b>13.5° Offset (Available with 48.26mm BHC only)</b>
Shaft Types (D, see drawing):	
	<b>M8 DIN tapered spline</b>
	<b>Cross pin</b>
	<b>Ø11mm shaft, full round profile</b>
	<b>Ø11mm shaft with D profile</b>
	<b>Ø12mm shaft, full round profile</b>
	<b>Ø12mm shaft with keyway and retaining ring groove</b>

Motor Identifiers								
Suffix	Desc	ID	SEL_GND	5V	SEL1	SEL2	SEL3	SEL4
00	All Motors	18FC8400	n/a	n/a	n/a	n/a	n/a	n/a
01	Motor 1 <sup>1</sup>	18FC8401	X	X	5V	5V	5V	SEL_GND
02	Motor 2 <sup>2</sup>	18FC8402	X	X	SEL_GND	5V	5V	SEL_GND
03	Motor 3	18FC8403	X	X	5V	SEL_GND	5V	SEL_GND
04	Motor 4	18FC8404	X	X	SEL_GND	SEL_GND	5V	SEL_GND
05	Motor 5	18FC8405	X	X	5V	5V	SEL_GND	SEL_GND
06	Motor 6	18FC8406	X	X	SEL_GND	5V	SEL_GND	SEL_GND
07	Motor 7	18FC8407	X	X	5V	SEL_GND	SEL_GND	SEL_GND
08	Motor 8	18FC8408	X	X	5V	5V	5V	5V
09	Motor 9	18FC8409	X	X	GND	5V	5V	5V
10	Motor 10	18FC8410	X	X	5V	SEL_GND	5V	5V
11	Motor 11	18FC8411	X	X	SEL_GND	SEL_GND	5V	5V
12	Motor 12	18FC8412	X	X	5V	5V	SEL_GND	5V
13	Motor 13	18FC8413	X	X	GND	5V	SEL_GND	5V
14	Motor 14	18FC8414	X	X	5V	SEL_GND	SEL_GND	5V
15	Motor 15	18FC8415	X	X	SEL_GND	SEL_GND	SEL_GND	5V



Ledger	
A	GND
B	B+
1	CAN_HI
2	CAN_LO
3	SEL1
4	CAN_SHLD
5	SEL2
6	SEL4
7	5V
8	SEL3
9	SEL_GND
10	M_CLR

<sup>1</sup> Motor 1 (18FC8401) typically used for the driver side wiper motor.

<sup>2</sup> Motor 2 (18FC8402) typically used for the passenger side wiper motor.

**Transmitted Messages**

PGN HEX	FRAME FORMAT	DLC
0FFB2	J1939PNG	5

IDENTIFIER	Byte Number	NAME	Max Range	VALUES	Units	Frequency		
18FFB2##	D0	MODE	0-6	0 = idle (not running)	Discrete	As requested by VCU (see RX messages)		
				1 = Slow Speed				
				2= Medium Speed				
				3=High Speed				
				4=Cleaning				
				5=Hard Stop/Error				
18FFB2##	D1	HOME	0-1	0 = Not in Park position	Discrete	As requested by VCU (see RX messages)		
				1 = in Park Position				
18FFB2##	D2	SPEED	0-255	0 - 70	RPM (actual numerical value)		As requested by VCU (see RX messages)	
18FFB2##	D3	POSITION	0-255	0-255	degrees (converted: 0-255 = 0-359)			
18FFB2##	D4	MAGNET STATUS	0-1	0=No Magnet Encoder Signal	Discrete			As requested by VCU (see RX messages)
				1=Magnet Encoder Signal				

\* Replace ## with motor identifier (see Motors Identifiers section)

### Received Messages

IDENTIFIER	DLC	D0	D0 dec	D0 (hex)	Description	Motor Response
18FC84##	1	0b00000000	0	0	Switch OFF cleaning/switch off wiper	Wiper System set to park position (29 RPM), Transmits requested data
18FC84##	1	0b00000001	1	1	Switch ON Cleaning	Wiper System Cleaning Routine Wiper System Running for 3 more cycles if message is present for more than 3 cycles (40 RPM), Transmits requested data
18FC84##	1	0b00000010	2	2	error/hard stop	Wipers System Hard Stop, Transmits requested data
18FC84##	1	0b00000011	3	3	No Action	No action, Transmits requested data
18FC84##	1	0b00000100	4	4	switch ON wiper to normal (first speed)(Low Speed)	Wiper System Low Speed (29 RPM, CCW), Transmits requested data
18FC84##	1	0b00001000	8	8	switch ON wiper to second Speed (Medium Speed)	Wiper System Medium Speed (40 RPM, CCW), Transmits requested data
18FC84##	1	0b00001100	12	0C	switch ON wiper to third speed (High Seed)	Wiper System High Speed (60 RPM, CCW), Transmits requested data
18FC84##	1	0b11111000	248	F8	error/hard stop	Wiper System Hard Stop, Transmits requested data
18FC84##	1	0b11111100	252	FC	No Action	No Action, Transmits requested data

\* Replace ## with motor identifier (see Motors Identifiers section)