



Screwdriving technology

Automation

Air motors

Air tools

# DEPRAG

## MICROMAT-F / MINIMAT-F SCREWDRIVING SYSTEM

- Handheld screwdriver
- Multi function control
- Pneumatic control

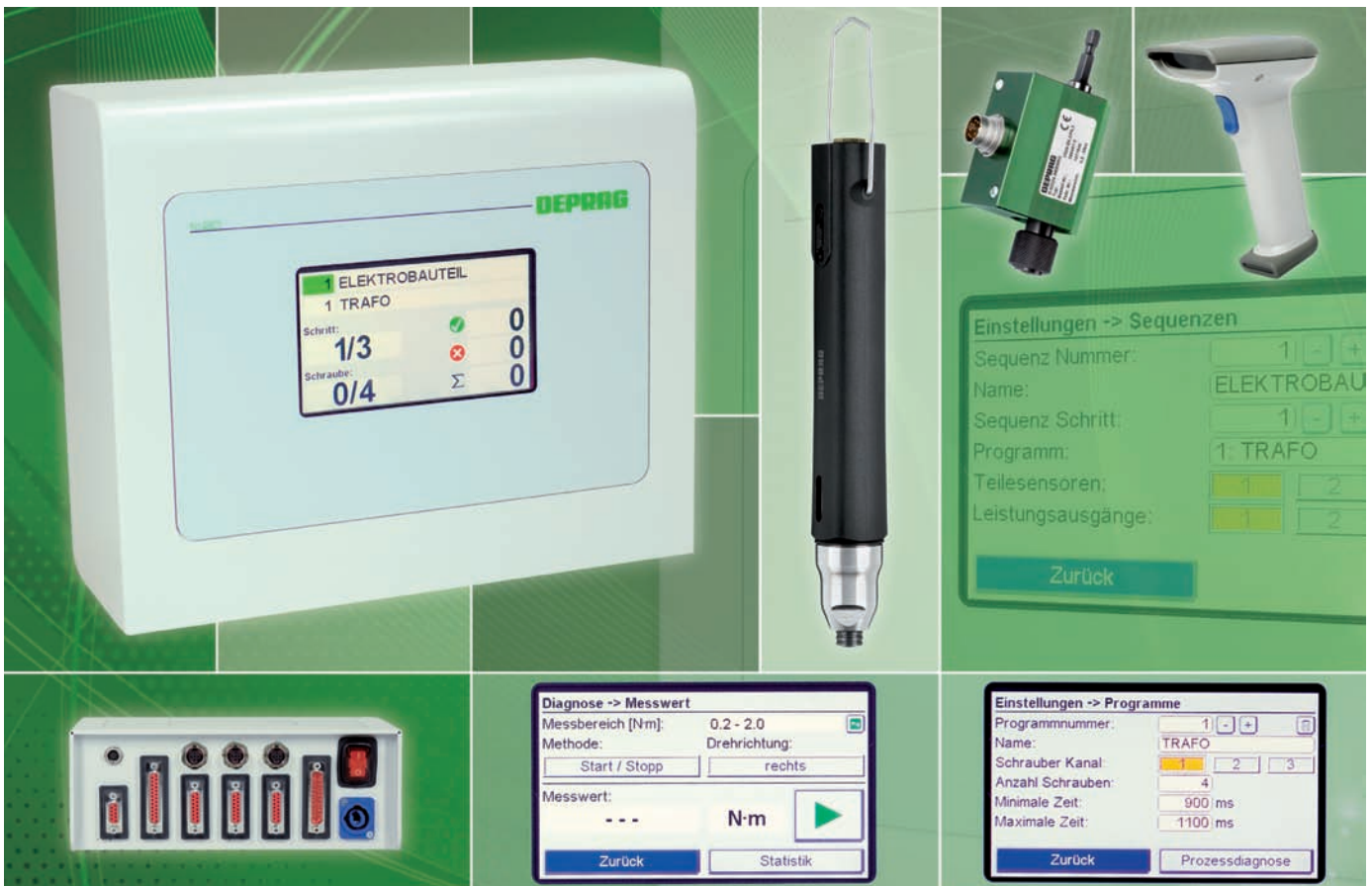
to guarantee production quality.

Complex assembly processes can be monitored by programmable sequences. The new function controller fc 20 offers:

- Flexibility
- Diverse functionality
- User friendliness
- Process security

Screwdriving processes for up to seven sequences of respectively 99 programs each can be created individually.

With the new fc 20, which can control up to three different types of screwdriver, high flexibility in the various screwdriving demands of a component can be reached. The controlled execution of assembly steps are performed in sequence.



After detecting the start signal from the screwdriver (operator push down or start trigger), the air supply to the driver is enabled via the new fc 20 controller combined with the pc 10 pneumatic interface. When reaching the preset torque value, the screwdriver stops by way of the high-precision shut-off clutch. In connection with the pc 10 pneumatic interface and a sensor in the screwdriver (MICROMAT/MINIMAT-F) the fc 20 controller is able to confirm the correct screw assembly sequence. The screw tightening time is compared to a minimum/maximum pre-programmed time window. If the screw tightening time is too short (cross thread) or too long (stripped screw) the operator is alerted by a failure message. In addition an onboard sensor confirms that the screwdriver is enabled until the clutch mechanism is disengaged insuring that the cycle was not terminated as a result of the operator lifting the screwdriver prematurely. This confirms that the tightening process was carried out properly without material failures or influence by the operator. In addition, the number of screw assembly operations per part can be controlled. No screw will be forgotten!

The fc 20's documentation features are especially versatile. Each respective screw-driving process can be attributed to a specific workpiece. Optionally, a barcode scanner can be connected to the fc 20, the end values are stored along with the respective screwdriving process on the component's barcode. These end values are stored for seven days and can be transferred to a PC via a serial interface for process traceability. The number of good/bad screwdriving processes as well as the average screwdriving duration allow for control and optimization of the assembly process. An extensive range of diagnostic possibilities round off the wide spectrum of the new screwdriver control's application options. Using a transducer, the worker can control the preset torque directly at the workpiece, making it much easier for maintenance and quality management. Integrated diagnostic features are able to test all of the control's inputs and outputs and display their current states. Furthermore, an internal voltage monitor ensures fc 20's continuous functional reliability.

Reliable pass/fail process monitoring is only guaranteed with the use of a non reversible screwdriver. In order to assure best possible process quality, we recommend to apply right-hand rotation drivers wherever possible.

In short, the Screwdriver with Multi-Function Controller monitors itself and assures a 100% correctness of your assembly.

The MINIMAT-F Screwdriver incorporates the well-known advantages of the DEPRAG-MINIMAT Screwdriver series and oilfree operation is possible.

When connected to an automatic Screwfeeder, the feeding of the screw is controlled by the fc 20. The controller is connected to the Screwfeeder using an optionally available SZG-connection set.

## Technical Data

### DEPRAG-MICROMAT-F-Screwdriver straight

Screwdriver Style		Motor Size 0			
Driver right rotation	Type order no.	<b>345F-308</b> 399400 A	<b>345F-408</b> 399400 B	<b>345F-708</b> 399400 C	<b>345F-508</b> 399400 D
Screws	up to	M3	M3	M3	M3
Torque min.	Ncm / in.oz	2 / 3	2 / 3	2 / 3	2 / 3
Torque max. (soft pull-up)	Ncm / in.oz	50 / 70	55 / 78	70 / 97	70 / 97
Torque max. (hard pull-up)	Ncm / in.oz	60 / 83	55 / 78	70 / 97	70 / 97
Speed, idling	rpm	1600	1100	600	350
Internal hex. drive DIN 3126		B 3 (3 mm/.118")	B 3 (3 mm/.118")	B 3 (3 mm/.118")	B 3 (3 mm/.118")

Suitable tool inserts and connecting components with a drive as per DIN 3126 – A 3 (3 mm), see also in our brochure D 3320 E.  
Further technical details see leaflet D 3420 E.

### DEPRAG-MINIMAT-F-Screwdriver straight

Screwdriver Style		Motor Size 1				Motor Size 2			
Driver right rotation	Type order no.	<b>347F-218</b> 397061 A	<b>347F-318</b> 397061 B	<b>347F-518</b> 397061 C	<b>347F-618</b> 397061 D	<b>347F-228</b> 386365 A	<b>347F-328</b> 386365 B	<b>347F-428</b> 386365 D	<b>347F-528</b> 386365 C
Screws	up to	M3	M3	M3	M3	M4	M4	M4	M5
Torque min.	Nm / in.lbs	0.3 / 3	0.3 / 3	0.2 / 2	0.2 / 2	0.5 / 5	0.4 / 4	0.4 / 4	0.3 / 3
Torque max. (soft pull-up)	Nm / in.lbs	1 / 9	1.4 / 12	2 / 18	2 / 18	1.8 / 16	3 / 26	4 / 35	5 / 44
Torque max. (hard pull-up)	Nm / in.lbs	1 / 9	1.4 / 12	2 / 18	2 / 18	2 / 18	3.2 / 28	4.5 / 40	5 / 44
Speed, idling	rpm	1900	1300	900	600	4000	1550	1000	680
Internal hex. drive DIN 3126		F 6.3 (1/4")	F 6.3 (1/4")	F 6.3 (1/4")	F 6.3 (1/4")	F 6.3 (1/4")	F 6.3 (1/4")	F 6.3 (1/4")	F 6.3 (1/4")
Screwdriver Style		Motor Size 2.5				Motor Size 3			
Driver right rotation	Type order no.	<b>345F-7258</b> 401537 A	<b>345F-3258</b> 401537 B	<b>345F-4258</b> 401537 C		<b>346F-238</b> 396359 B	<b>346F-738</b> 396359 C	<b>346F-338</b> 396359 D	<b>346F-438*</b> 396359 E
Screws	up to	M5	M6	M6		M5	M6	M6	M8
Torque min.	Nm / in.lbs	1 / 9	1 / 9	1 / 9		2 / 18	2 / 18	2 / 18	2 / 18
Torque max. (soft pull-up)	Nm / in.lbs	5 / 44	10 / 88	12 / 106		5 / 44	8 / 71	14 / 123	20 / 177
Torque max. (hard pull-up)	Nm / in.lbs	6 / 53	10 / 88	12 / 106		6 / 53	9 / 80	14 / 123	20 / 177
Speed, idling	rpm	1100	680	310		2500	1400	750	400
Internal hex. drive DIN 3126		F 6.3 (1/4")	F 6.3 (1/4")	F 6.3 (1/4")		F 6.3 (1/4")	F 6.3 (1/4")	F 6.3 (1/4")	F 6.3 (1/4")

Incl. 3 m / 10 ft. air supply hose (lengths up to 5 m / 16.4 ft. available)  
Further technical details see leaflet D 3430 E.

\* Use only with additional handle or parallelogram-stand

## DEPRAG-MINIMAT-F-Screwdriver pistol-grip

Screwdriver Style		Motor Size 2					
Driver right rotation lower air-inlet	Type order no.	<b>347F-227</b> 391735 A	<b>347F-327</b> 391735 B	<b>347F-427</b> 391735 D	<b>347F-527</b> 391735 C		
Driver right rotation upper air-inlet	Type order no.	<b>347F-227O</b> 391473 A	<b>347F-327O</b> 391473 B	<b>347F-427O</b> 391473 D	<b>347F-527O</b> 391473 C		
Screws	up to	M3	M4	M4	M5		
Torque min.	Nm / in.lbs	0.4 / 4	0.4 / 4	0.4 / 4	0.3 / 3		
Torque max. (soft pull-up)	Nm / in.lbs	1.5 / 13	3 / 26	3.5 / 31	5 / 44		
Torque max. (hard pull-up)	Nm / in.lbs	1.8 / 16	3.2 / 28	4 / 35	5 / 44		
Speed, idling	rpm	4000	1550	1000	680		
Internal hex. drive DIN 3126		F 6.3 (1/4")	F 6.3 (1/4")	F 6.3 (1/4")	F 6.3 (1/4")		
Driver reversible lower air-inlet	Type order no.	<b>347F-227U</b> 395047 A	<b>347F-327U</b> 395047 B	<b>347F-427U</b> 395047 D	<b>347F-527U</b> 395047 C		
Driver reversible upper air-inlet	Type order no.	<b>347F-227OU</b> 395052 A	<b>347F-327OU</b> 395052 B	<b>347F-427OU</b> 395052 D	<b>347F-527OU</b> 395052 C		
Screws	up to	M3	M4	M4	M5		
Torque min.	Nm / in.lbs	0.4 / 4	0.4 / 4	0.4 / 4	0.3 / 3		
Torque max. (soft pull-up)	Nm / in.lbs	1.5 / 13	3 / 26	3.5 / 31	5 / 44		
Torque max. (hard pull-up)	Nm / in.lbs	1.8 / 16	3.2 / 28	4 / 35	5 / 44		
Speed, idling	rpm	3000	1100	750	500		
Internal hex. drive DIN 3126		F 6.3 (1/4")	F 6.3 (1/4")	F 6.3 (1/4")	F 6.3 (1/4")		
Screwdriver Style		Motor Size 2.5			Motor Size 3		
Driver right rotation	Type order no.	<b>345F-7257</b> 394625 A	<b>345F-3257</b> 394625 B	<b>345F-4257</b> 394625 C	<b>346F-737</b> 400561 C	<b>346F-337</b> 400561 D	<b>346F-437</b> 400561 E
Screws	up to	M5	M6	M6	M6	M6	M8
Torque min.	Nm / in.lbs	1 / 9	1 / 9	1 / 9	2 / 18	2 / 18	2 / 18
Torque max. (soft pull-up)	Nm / in.lbs	5 / 44	10 / 88	12 / 106	8 / 71	14 / 124	20 / 177
Torque max. (hard pull-up)	Nm / in.lbs	6 / 53	10 / 88	12 / 106	9 / 80	14 / 124	20 / 177
Speed, idling	rpm	1025	525	270	1400	750	400
Internal hex. drive DIN 3126		F 6.3 (1/4")	F 6.3 (1/4")	F 6.3 (1/4")	F 6.3 (1/4")	F 6.3 (1/4")	F 6.3 (1/4")
Driver reversible	Type order no.				<b>346F-737U</b> 402845 C	<b>346F-337U</b> 402845 D	<b>346F-437U</b> 402845 E
Screws	up to				M6	M6	M8
Torque min.	Nm / in.lbs				2 / 18	2 / 18	2 / 18
Torque max. (soft pull-up)	Nm / in.lbs				7 / 62	12 / 106	20 / 177
Torque max. (hard pull-up)	Nm / in.lbs				8 / 71	12 / 106	20 / 177
Speed, idling	rpm				1200	650	320
Internal hex. drive DIN 3126					F 6.3 (1/4")	F 6.3 (1/4")	F 6.3 (1/4")

Incl. 3 m / 10 ft. air supply hose (lengths up to 5 m / 16.4 ft. available)  
Further technical details see leaflet D 3435 E.

Suitable tool inserts and connecting components with a drive as per DIN 3126 – E 6.3 (1/4"), see also in our brochure D 3320 E.

## DEPRAG-MINIMAT-F-Screwdriver angle-head design

Screwdriver Style		Motor Size 2			Motor Size 2.5		
Driver right rotation	Type order no.	<b>377F-321</b> 389689 B	<b>377F-421</b> 389689 D	<b>377F-521</b> 389689 C	<b>376F-7251</b> 392061 A	<b>376F-3251</b> 392061 B	
Screws	up to	M4	M5	M5	M6	M6	
Torque min.	Nm / in.lbs	0.4 / 4	0.4 / 4	0.3 / 3	1.5 / 13	1.5 / 13	
Torque max.	Nm / in.lbs	3.5 / 31	4.5 / 40	6.5 / 57	8 / 70	15 / 132	
Speed, idling	rpm	820	530	380	810	410	
External square drive DIN 3121		E 6.3 (1/4")	E 6.3 (1/4")	E 6.3 (1/4")	E 6.3 (1/4")	E 6.3 (1/4")	
Screwdriver Style		Motor Size 3					
Driver right rotation	Type order no.	<b>377F-731</b> 404085 C	<b>377F-331</b> 404085 D	<b>377F-431</b> 404085 E			
Screws	up to	M6	M8	M10			
Torque min.	Nm / in.lbs	4 / 35	4 / 35	4 / 35			
Torque max.	Nm / in.lbs	13 / 115	23 / 204	33 / 292			
Speed, idling	rpm	840	450	240			
External square drive DIN 3121		E 12.5 (1/2")	E 12.5 (1/2")	E 12.5 (1/2")			

Incl. 3 m / 10 ft. air supply hose (lengths up to 5 m / 16.4 ft. available)  
Further technical details see leaflet D 3450 E.

Suitable tool inserts and connecting components with a drive as per DIN 3121 – G 6.3 (1/4"), G 10 (3/8"), G 12.5 (1/2"), see also in our brochure D 3320 E.

## Function control fc 20

Function control	Type order no.	fc 20 385523 A
Amount of connectable drivers		3
Voltage	V / Hz	100 - 240 AC / 50 - 60
Power consumption	VA	18
Display and operation		TFT - graphic display 4.3" (480x272 pixel) with touch screen
RS232 interface		yes
PLC interface		yes
Power output		yes (5 pieces)
Connection for part sensor		yes (3 pieces)
Connection for in-line torque transducer		yes
Dimensions (W x H x D)	mm in.	243 x 200 x 90 9.5 x 7.8 x 3.5
Weight	kg / lbs.	2.9 / 6.4

The new function control fc 20 was developed for use in combination with DEPRAG pneumatic screwdrivers: MICROMAT-F, MINIMAT-F and DEPRAG electronic handheld screwdrivers of the 341 series (leaflet D 3480 E).



fc 20

## Pneumatic control pc 10

Pneumatic control	Type order no.	pc 10 387551 A
Supply air connection		1/4" (Plugs nominal size 7.2)
Operating pressure	bar / PSI	5 - 6.3 / 71 - 90
Air flow	m <sup>3</sup> /min / cfm	0.1-0.45 (3.5 - 16)
Dimensions (W x H x D)	mm in.	160 x 90 x 160 6 <sup>5</sup> / <sub>16</sub> x 3 <sup>9</sup> / <sub>16</sub> x 6 <sup>5</sup> / <sub>16</sub>
Weight	kg / lbs.	1.2 / 2.6



pc 10

## Optional Equipment

Proximity switch for parts control		
capacitive M18	order no.	354841 C
capacitive M12	order no.	354841 D
inductive M18	order no.	354906 D
Screwfeeder connection set		
cable length 1m (3.3 ft.) / 2m (6.6 ft.)	order no.	356850 C / 356850 D
Table stand (set)	order no.	414701 A
In-line torque transducer	order no.	385481 B/C/D/E
Connection cable for in-line torque transducer 2m / 4m / 6m	order no.	385486 A/B/C
Connection cable fc 20 - pc 10 *)	order no.	385541 A

\*) Required accessory for pc 10

# DEPRAG

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