HEF. NC: Inclusion         CON         Finit         DESCRIPTION         Description <thd< th=""><th></th><th></th><th>L</th><th></th><th>_</th><th></th><th>REVISION</th><th></th><th></th><th></th></thd<>			L		_		REVISION			
GENERAL: MODEL COP4305 13 A SEALED, 45 SIM (1.77) 0.D., de mm (0.230') SIMPT PRECISION CONDUCTVE PLASTIC POTENTIOMETER. ITS SUPERS OUALTY, RELADIUTY AND PERFORMANCE MARCEPASS SUITABLE FOR APPLICATIONS IN HUMID, DUSTY, OLY OPERATING ENVIRONMENT.         ELECTRICAL SPECIFICATIONS: ELECTRICAL ANGLE: DTAL RESISTANCE: DO 0.5%, 1%, 2%, 5%, 10% and 20% OHMS TOTAL RESISTANCE: DO 0.5%, 1%, 2%, 5%, 1%, 10% and 20% OHMS TOTAL RESISTANCE: DO 0.5%, 1%, 2%, 5%, 1%, 1%, 1%, 1%, 10% and 20% OHMS TOTAL RESISTANCE: DO 0.5%, 1%, 2%, 5%, 1%, 1%, 1%, 1%, 1%, 1%, 1%, 1%, 1%, 1		KEF. NO: MPCL98CA	AT P66	C.O.N						APPR'D
UNMAL:       UNDEL CAP-uspeed to ADDALED under mining (1,77) O.D., volume (0.328) SUMAT         MODEL CAP-uspeed to ADDALED UNDERGONNANCE MAKE CAP-488 SUITABLE         POR APPLICATIONS IN HUMD, DUSTY, OILY OPERATING ENVIRONMENT.         ELECTRICAL SPECIFICATIONS         ELECTRICAL SPECIFICATIONS         ELECTRICAL SPECIFICATIONS         ELECTRICAL SPECIFICATIONS         ELECTRICAL SPECIFICATIONS         ELECTRICAL ANALE:       350°         TOTAL RESISTANCE       90%, 1k, 2k, 5k, 10k and 20k OHMS         TOTAL RESISTANCE:       90%, 1k, 2k, 5k, 10k and 20k OHMS         DIBLECTRICAL ANALE:       350°         TOTAL RESISTANCE:       90%, 1k, 2k, 5k, 10k and 20k OHMS         DIBLECTRICAL ANALE:       300°         TOTAL RESISTANCE:       100 meg OHMS MIN. 4k 1,000 Vdc         DIBLECTRIC STRENGTH:       1,000 Vms aSD/040 Hz for 1 MINUTE         INSULATION RESISTANCE:       100 meg OHMS MIN. 4k 1,000 Vdc         DIBLECTRIC STRENGTH:       1,000 Vms aSD/040 Hz for 1 MINUTE         INSULATION RESISTANCE:       100 meg OHMS MIN. 4k 1,000 Vdc         DIBLECTRIC STRENGTH:       1,000 Vms aSD/040 Hz for 1 MINUTE         IFENTRONMENTAL SPECIFICATIONS:       100 MEG AMINUS         OVERATIONS:       100 GM MINUS         OVERATIONS:       100 GM MINUS         IFENTRONME			F							
PRECHANICAL SPECIFICATIONS:         ELECTRICAL SPECIFICATIONS:         ELECTRICAL ANGLE:         90.08,11K, 2K, 5K, 10K and 20K OHMS         TOTAL RESISTANCE:         90.08,11K, 2K, 5K, 10K and 20K OHMS         INSULATIONS IN HUMO, DUSTY, OLY OPERATING ENVIRONMENT.         ELECTRICAL ANGLE:         90.08,11K, 2K, 5K, 10K and 20K OHMS         TOTAL RESISTANCE:         91.03%. (±0.1% AVAILABLE.)         90.03%. (±0.1% AVAILABLE.)         1000 Vmms eMOV/00 IV (w1 HINITE         MECHANICAL ANGLE:         300 Vmms eMOV/00 IV (w1 HINITE         1000 Vmms eMOV/00 IV (w1 HINITE         1000 Vmms eMOV/00 IV (w1 HINITE         MECHANICAL ANGLE:         300°         TOROLE:       300°         INSULATIONS:         BERLETING TEMPERATIONS:         OPERATING TEMPERATIONS:         000 Vmms eMOV/00 IV (w1 HINITE         1000 Vmms eMOV/00 IV (w1 HINITE			-			1) ADDED "SE	ALABILITY: IP54"	07/12/02	T.TSUGAWA	
PERCHANICAL SPECIFICATIONS:         ELECTRICAL ANGLE:         300*         TOTAL RESISTANCE:         90.56, 1k, 2k, 5k, 10k and 20k OHMS         TOTAL RESISTANCE:         100 mg OHMS MIN, 6 1,000 Vdc         DELECTRICAL SPECIFICATIONS:         MECHANICAL SPECIFICATIONS:         SEALABILITY:         10 MILLION CYCLES MIN.         10 MILLION CYCLES MIN.         10 MILLION CYCLES MIN.         10										
POR APPLICATIONS IN HUMID, DUSTY, OLY OPERATING ENVIRONMENT.         ELECTRICAL SPECIFICATIONS         ELECTRICAL SPECIFICATIONS         ELECTRICAL RESISTANCE:       90%         TOTAL RESISTANCE:       90.5%, 11, 28, 5%, 10K and 20K OHMS         INREPARTITY (INDEPENDENT)       90.3%, (10% AVAILABLE)         NEEPEATING:       30%         INREPARTITY (INDEPENDENT)       90.03%, (20.03%, (20.03%, 10% OHMS MIN, @ 1,000 Vdc         DELECTRICS STRENGTH:       1,000 Vms @50/06 Hz for 1 MINUTE         MECHANICAL SPECIFICATIONS:       30%         INSULATIONS:       30%         SEALABILITY:       40°C to 1120°C         VIBRATIONS:       106 grom (2.1 ingo)         WEIGHT:       100 MILLION CYCLES MIN.				•	-	.,		•		•
ELECTRICAL SPECIFICATIONS: ELECTRICAL ANGLE: 300" TOTAL RESISTANCE: 00.03%. (+0.1% AVAILABLE ) INSULATION RESISTANCE: 100 meg OHMS MIN. @ 1.000 Vdc DIELECTRIC STRENGTH: 1.000 Vms @00/60 Hz for 1 MINULE MECHANICAL SPECIFICATIONS: MECHANICAL SPECIFICATIONS: MECHANICAL SPECIFICATIONS: MECHANICAL SPECIFICATIONS: MECHANICAL SPECIFICATIONS: MECHANICAL SPECIFICATIONS: MECHANICAL SPECIFICATIONS: MECHANICAL SPECIFICATIONS: MECHANICAL SPECIFICATIONS: OPERATING TEMPERATURE: 40°C to +120°C VIBRATIONS: 15 Ge, 2.000 Hz SRALABILITY: 0 IS 40°C to +120°C VIBRATIONS: 15 Ge, 2.000 Hz SRALABILITY: 0 IS 40°C to +120°C MECHANICAL SPECIFICATIONS: MECHANICAL SPECIFICATIONS: MECHANICAL ANGLE: 200° TORQUE: 150 gem (2.1 imag) WEIGHT: 40°C to +120°C VIBRATIONS: 15 Ge, 2.000 Hz SRALABILITY: 0 IS 40°C to +120°C VIBRATIONS: 15 Ge, 2.000 Hz SRALABILITY: 0 IS 40°C to +120°C VIBRATIONS: 15 Ge, 2.000 Hz SRALABILITY: 0 IS 40°C to +120°C VIBRATIONS: 15 Ge, 2.000 Hz SRALABILITY: 0 IS 40°C to +120°C VIBRATIONS: 15 Ge, 2.000 Hz SRALABILITY: 0 IS 40°C to +120°C VIBRATIONS: 15 Ge, 2.000 Hz SRALABILITY: 0 IS 40°C to +120°C VIBRATIONS: 15 Ge, 2.000 Hz SRALABILITY: 0 IS 40°C to +120°C VIBRATIONS: 15 Ge, 2.000 Hz SRALABILITY: 0 IS 40°C to +120°C VIBRATIONS: 15 Ge, 2.000 Hz SRALABILITY: 0 IS 40°C to +120°C VIBRATIONS: 15 Ge, 2.000 Hz SRALABILITY: 0 IS 40°C to +120°C VIBRATIONS: 15 Ge, 2.000 Hz SRALABILITY: 0 IS 40°C to +120°C VIBRATIONS: 15 Ge, 2.000 Hz SRALABILITY: 0 IS 40°C to +120°C VIBRATIONS: 15 Ge, 2.000 Hz SRALABILITY: 0 IS 40°C to +120°C VIBRATIONS: 15 Ge, 2.000 Hz SRALABILITY: 0 IS 40°C to +120°C VIBRATIONS: 15 Ge, 2.000 Hz SRALABILITY: 0 IS 40°C to +120°C VIBRATIONS: 15 Ge, 2.000 Hz SRALABILITY: 0 IS 40°C to +120°C VIBRATIONS: 15 Ge, 2.000 Hz SRALABILITY: 0 IS 40°C to +120°C VIBRATIONS: 15 Ge, 2.000 Hz SRALABILITY: 0 IS 40°C to +120°C VIBRATIONS: 15 GE, 2.000 Hz SRALABILITY: 0 IS 40°C to +120°C VIBRATIONS: 15 GE, 2.000 Hz SRALABILITY: 0 IS 40°C to +120°C SRALBBILITY: 0 IS 40°C to +120							K		~	
ELECTRICAL SPECIFICATIONS:       150°         POWER ATING:       20.3%. (±0.1% AVAILABLE )         REPEATABILITY:       ±0.003%         POWER ATING:       30.3%. (±0.1% AVAILABLE )         REPEATABILITY:       ±0.003%         POWER ATING:       30.3%. (±0.1% AVAILABLE )         REPEATABILITY:       ±0.003%         POWER ATING:       30.0%         INSULATION RESISTANCE:       100 mag OHNS MIN. @ 1.000 Vide         INSULATION RESISTANCE:       100 mag OHNS MIN. @ 1.000 Vide         INSULATION RESISTANCE:       100 mag OHNS MIN. @ 1.000 Vide         INSULATION RESISTANCE:       150 gon (2.1 in-o2)         WEIGHT:       APPROX. 60 (2.1 in-o2)         WEIGHT:       APPROX. 60 (2.1 in-o2)         UNERATIONS:       150 gon (2.1 in-o2)         VIBRATIONS:       150 gon (2.1 in-o2)         SHOCK:       50G6, 11 mS         SHOCK:       50G6, 11 mS         SHOCK:       50G6, 11 mS         IFGURE 2 MOUNTING DIMENSION       FIGURE 3 WIRING DIAGRAM         VIBRATIONS:       19.54         SHOCK:       50G6, 11 mS         SHOCK:       50G6, 11 mS         IFGURE 2 MOUNTING DIMENSION       FIGURE 3 WIRING DIAGRAM         VIBRATIONS:       19.54 <t< td=""><td>FOR AFFEICATIONS IN HOMID, DOST</td><td>T, OLET OF ERATING ENVIR</td><td>ONMENT.</td><td></td><td></td><td>₽⇒</td><td>&gt;  &lt;− 3</td><td></td><td>(1)/ R2</td><td>7 MAX.</td></t<>	FOR AFFEICATIONS IN HOMID, DOST	T, OLET OF ERATING ENVIR	ONMENT.			₽⇒	>  <− 3		(1)/ R2	7 MAX.
ELECTRICAL SPECIFICATIONS:       150°         POWER ATING:       20.3%. (±0.1% AVAILABLE )         REPEATABILITY:       ±0.003%         POWER ATING:       30.3%. (±0.1% AVAILABLE )         REPEATABILITY:       ±0.003%         POWER ATING:       30.3%. (±0.1% AVAILABLE )         REPEATABILITY:       ±0.003%         POWER ATING:       30.0%         INSULATION RESISTANCE:       100 mag OHNS MIN. @ 1.000 Vide         INSULATION RESISTANCE:       100 mag OHNS MIN. @ 1.000 Vide         INSULATION RESISTANCE:       100 mag OHNS MIN. @ 1.000 Vide         INSULATION RESISTANCE:       150 gon (2.1 in-o2)         WEIGHT:       APPROX. 60 (2.1 in-o2)         WEIGHT:       APPROX. 60 (2.1 in-o2)         UNERATIONS:       150 gon (2.1 in-o2)         VIBRATIONS:       150 gon (2.1 in-o2)         SHOCK:       50G6, 11 mS         SHOCK:       50G6, 11 mS         SHOCK:       50G6, 11 mS         IFGURE 2 MOUNTING DIMENSION       FIGURE 3 WIRING DIAGRAM         VIBRATIONS:       19.54         SHOCK:       50G6, 11 mS         SHOCK:       50G6, 11 mS         IFGURE 2 MOUNTING DIMENSION       FIGURE 3 WIRING DIAGRAM         VIBRATIONS:       19.54 <t< td=""><td></td><td></td><td></td><td></td><td> (</td><td>──┌╩╖∟</td><td></td><td></td><td><math>\mathbf{I} &gt; \mathbf{I}</math></td><td></td></t<>					(	──┌╩╖∟			$\mathbf{I} > \mathbf{I}$	
ELECTRICAL SPECIFICATIONS:       150°         POWER ATING:       20.3%. (±0.1% AVAILABLE )         REPEATABILITY:       ±0.003%         POWER ATING:       30.3%. (±0.1% AVAILABLE )         REPEATABILITY:       ±0.003%         POWER ATING:       30.3%. (±0.1% AVAILABLE )         REPEATABILITY:       ±0.003%         POWER ATING:       30.0%         INSULATION RESISTANCE:       100 mag OHNS MIN. @ 1.000 Vide         INSULATION RESISTANCE:       100 mag OHNS MIN. @ 1.000 Vide         INSULATION RESISTANCE:       100 mag OHNS MIN. @ 1.000 Vide         INSULATION RESISTANCE:       150 gon (2.1 in-o2)         WEIGHT:       APPROX. 60 (2.1 in-o2)         WEIGHT:       APPROX. 60 (2.1 in-o2)         UNERATIONS:       150 gon (2.1 in-o2)         VIBRATIONS:       150 gon (2.1 in-o2)         SHOCK:       50G6, 11 mS         SHOCK:       50G6, 11 mS         SHOCK:       50G6, 11 mS         IFGURE 2 MOUNTING DIMENSION       FIGURE 3 WIRING DIAGRAM         VIBRATIONS:       19.54         SHOCK:       50G6, 11 mS         SHOCK:       50G6, 11 mS         IFGURE 2 MOUNTING DIMENSION       FIGURE 3 WIRING DIAGRAM         VIBRATIONS:       19.54 <t< td=""><td></td><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td><td><math>\gg</math> <math>^{\sim}</math></td><td></td></t<>				1					$\gg$ $^{\sim}$	
ELECTRICAL SPECIFICATIONS:       150°         POWER ATING:       20.3%. (±0.1% AVAILABLE )         REPEATABILITY:       ±0.003%         POWER ATING:       30.3%. (±0.1% AVAILABLE )         REPEATABILITY:       ±0.003%         POWER ATING:       30.3%. (±0.1% AVAILABLE )         REPEATABILITY:       ±0.003%         POWER ATING:       30.0%         INSULATION RESISTANCE:       100 mag OHNS MIN. @ 1.000 Vide         INSULATION RESISTANCE:       100 mag OHNS MIN. @ 1.000 Vide         INSULATION RESISTANCE:       100 mag OHNS MIN. @ 1.000 Vide         INSULATION RESISTANCE:       150 gon (2.1 in-o2)         WEIGHT:       APPROX. 60 (2.1 in-o2)         WEIGHT:       APPROX. 60 (2.1 in-o2)         UNERATIONS:       150 gon (2.1 in-o2)         VIBRATIONS:       150 gon (2.1 in-o2)         SHOCK:       50G6, 11 mS         SHOCK:       50G6, 11 mS         SHOCK:       50G6, 11 mS         IFGURE 2 MOUNTING DIMENSION       FIGURE 3 WIRING DIAGRAM         VIBRATIONS:       19.54         SHOCK:       50G6, 11 mS         SHOCK:       50G6, 11 mS         IFGURE 2 MOUNTING DIMENSION       FIGURE 3 WIRING DIAGRAM         VIBRATIONS:       19.54 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td>Ø6<sup>+0.000</sup> 0 1</td><td></td><td></td><td></td></t<>							Ø6 <sup>+0.000</sup> 0 1			
ELECTRICAL ANGLE: 300° TOTAL RESISTANCE TOLERANCE: 400,5K, 1K, 2K, 5K, 10K and 20K OHMS LINEARITY (INDEPENDENT): © 20,3% (±0,1% AVAILABLE) REPEATABILITY: ± ±0.003% POWER RATING: ± 30,00 Vms @50/60 Hz for 1 MINUTE MECHANICAL SPECIFICATIONS: MECHANICAL SPECIFICATIONS: MECHANICAL SPECIFICATIONS: ILIFE: ± 10 MILLION CYCLES MIN. ENVIRONMENTAL SPECIFICATIONS: OPERATING TEMPERATURE: 40°C to +120°C VIBALTON: 50Gs, 11 mS SHOCK: 50GS, 11 mS	ELECTRICAL SPECIFICATIONS:								//	\
TOTAL RESISTANCE: 00.8k, 1k, 2k, 5k, 10k and 20k OHMS TOTAL RESISTANCE TOLERANCE: 15% UINEARTY (INDEPENDENT): 00.3% (10.1% AVAILABLE ) REPEATABILITY: 100 meg OTMS MIN. @ 1,000 Vdc DIELECTRIC STRENGTH: 1,000 Vdc g0/04 (2 for 1 MINUTE MECHANICAL ANGLE: 390' TORQUE: 150 g-01 (2.1 in-02) WEIGHT: APPROX. 60 g (2.1 oz) LIFE: 10 MILLION CYCLES MIN. ENVIRONMENTAL SPECIFICATIONS: OPERATING TEMPERATURE: 40°C to +120°C VIBRATIONS: 15 GB, 2,000 Hz SEALABILITY: 9 H54 UVERSO OTHERWORK SEALABILITY: 9 H54 UVERSO OTHERWORK MICH MINUTE MECHANICAL ANGLE: 390' TORQUE: 10 MILLION CYCLES MIN. ENVIRONMENTAL SPECIFICATIONS: SEALABILITY: 9 H54 UVERSO OTHERWORK SEALABILITY: 9 H54 UVERSO OTHERWORK MICH MINUTE MICH MINUTE MIC		25.0°					<b>II W</b> † † <b>I</b>	$\downarrow$	1	1
TOTAL RESISTANCE TOLERANCE:       ±15%         LINEARITY (INDEPENDENT):       ±0.03%.         POWER RATING:       3003%.         POWER RATING:       3007*         INSULATION RESISTANCE:       1000 mg OHMS MIN. @ 1,000 Vdc         DIELECTRIC STRENGTH:       1.000 Vms @50/60 Hz for 1 MINUTE         MECHANICAL SPECIFICATIONS:       300*         MECHANICAL SPECIFICATIONS:       150 g-cm (2.1 in-o2)         WEIGHT:       APPROX. 60 g (2.1 o2)         LIFE:       10 MILLION CYCLES MIN.         ENVIRONMENTAL SPECIFICATIONS:       50 Gs, 2.000 Hz         GOER 11 mS       50 Gs, 11 mS         SEALABILITY:       15 G8, 2.000 Hz         BEALABILITY:       15 GB, 2.000 Hz         BEALBILITY:       15 GB, 2.000 Hz         BEALABILITY:       15 GB, 2.000 Hz				ø45 —			+	— -(++)		}} ─
LINEARITY (INDEPENDENT): B 40.3%. ( 40.1% AVAILABLE ) REPEATABILITY: INSULATION RESISTANCE: INSULATION RESISTANCE:			20k OHIVIS	1				$\downarrow$		//
REPEATABLITY: POWER RATING: INSULATION RESISTANCE: INSULATION RESISTANCE: INSULATION RESISTANCE: INSULATION RESISTANCE: INSULATION RESISTANCE: INSULATION RESISTANCE: INSULATION RESISTANCE: INSULATION RESISTANCE: INSULATION RESISTANCE: INSULATION RESISTANCE: RECHANICAL ANGLE: 200° TORQUE: WEIGHT: LIFE: OPERATING TEMPERATURE: SPACIFICATIONS: SEALABILITY: INSULATIONS: SEALA	(F		BLE)					1		/
POWER RATING: INSULATION RESISTANCE: INSULATION RESI			, ,							
DIELECTRIC STRENGTH: 1.000 VIIIs @50/60 H2 for 1 MINUTE MECHANICAL SPECIFICATIONS: MECHANICAL ANGLE: 360° TORQUE: 150 gcm (2.1 in-oz) WEIGHT: LIFE: 0 MILLION CYCLES MIN. ENVIRONMENTAL SPECIFICATIONS: OPERATING TEMPERATURE: -40°C to +120°C VIRATIONS: SEALABILITY: 0 UNLESS OTHERWISE 15 Gs, 2,000 Hz 50 Gs, 11 mS SEALABILITY: 0 UNLESS OTHERWISE H54 UNLESS OTHERWISE MILLION CYCLES MIN. 15 Gs, 2,000 Hz 50 Gs, 11 mS SEALABILITY: 0 UNLESS OTHERWISE MILLION CYCLES MIN. 15 Gs, 2,000 Hz 50 Gs, 11 mS SEALABILITY: 0 UNLESS OTHERWISE MILLION CYCLES MIN. 15 Gs, 2,000 Hz 50 Gs, 11 mS SEALABILITY: 0 UNLESS OTHERWISE MILLION CYCLES MIN. 15 Gs, 2,000 Hz 50 Gs, 11 mS SEALABILITY: 0 MILLION CYCLES MIN. 15 Gs, 2,000 Hz 50 Gs, 11 mS SEALABILITY: 0 MILLION CYCLES MIN. 15 Gs, 2,000 Hz 50 Gs, 11 mS SEALABILITY: 0 MILLION CYCLES MIN. 15 Gs, 2,000 Hz 50 Gs, 11 mS SEALABILITY: 0 MILLION CYCLES MIN. 15 Gs, 2,000 Hz 50 Gs, 11 mS SEALABILITY: 0 MILLION CYCLES MIN. 15 Gs, 2,000 Hz 50 Gs, 11 mS SEALABILITY: 0 MILLION CYCLES MIN. 15 Gs, 2,000 Hz 50 Gs, 11 mS SECHTION DWG MILLION CYCLES MIN. 15 Gs, 2,000 Hz 50 Gs, 11 mS SECHTION DWG MILLION CYCLES MIN. 16 GURE 2 MOUNTING DIMENSION FIGURE 2 MOUNTING DIMENSION FIGURE 3 WIRING DIAGRAM MILLION CYCLES MIN. 17 MULLION CYCLES MIN. 17 MULLION CYCLES MIN. 16 GURE 3 DIMENSION FIGURE 2 MOUNTING DIMENSION FIGURE 3 WIRING DIAGRAM MILLION CYCLES MIN. MILLION CYCLES MIN. MILLION CYCLES MIN. 17 MULLION CYCLES MIN.	REPEATABILITY:	<u>+</u> 0.003%						<	//	
DIELECTRIC STRENGTH: 1.000 VIIIs @50/60 H2 for 1 MINUTE MECHANICAL SPECIFICATIONS: MECHANICAL ANGLE: 360° TORQUE: 150 gcm (2.1 in-oz) WEIGHT: LIFE: 0 MILLION CYCLES MIN. ENVIRONMENTAL SPECIFICATIONS: OPERATING TEMPERATURE: -40°C to +120°C VIRATIONS: SEALABILITY: 0 UNLESS OTHERWISE 15 Gs, 2,000 Hz 50 Gs, 11 mS SEALABILITY: 0 UNLESS OTHERWISE H54 UNLESS OTHERWISE MILLION CYCLES MIN. 15 Gs, 2,000 Hz 50 Gs, 11 mS SEALABILITY: 0 UNLESS OTHERWISE MILLION CYCLES MIN. 15 Gs, 2,000 Hz 50 Gs, 11 mS SEALABILITY: 0 UNLESS OTHERWISE MILLION CYCLES MIN. 15 Gs, 2,000 Hz 50 Gs, 11 mS SEALABILITY: 0 UNLESS OTHERWISE MILLION CYCLES MIN. 15 Gs, 2,000 Hz 50 Gs, 11 mS SEALABILITY: 0 MILLION CYCLES MIN. 15 Gs, 2,000 Hz 50 Gs, 11 mS SEALABILITY: 0 MILLION CYCLES MIN. 15 Gs, 2,000 Hz 50 Gs, 11 mS SEALABILITY: 0 MILLION CYCLES MIN. 15 Gs, 2,000 Hz 50 Gs, 11 mS SEALABILITY: 0 MILLION CYCLES MIN. 15 Gs, 2,000 Hz 50 Gs, 11 mS SEALABILITY: 0 MILLION CYCLES MIN. 15 Gs, 2,000 Hz 50 Gs, 11 mS SEALABILITY: 0 MILLION CYCLES MIN. 15 Gs, 2,000 Hz 50 Gs, 11 mS SECHTION DWG MILLION CYCLES MIN. 15 Gs, 2,000 Hz 50 Gs, 11 mS SECHTION DWG MILLION CYCLES MIN. 16 GURE 2 MOUNTING DIMENSION FIGURE 2 MOUNTING DIMENSION FIGURE 3 WIRING DIAGRAM MILLION CYCLES MIN. 17 MULLION CYCLES MIN. 17 MULLION CYCLES MIN. 16 GURE 3 DIMENSION FIGURE 2 MOUNTING DIMENSION FIGURE 3 WIRING DIAGRAM MILLION CYCLES MIN. MILLION CYCLES MIN. MILLION CYCLES MIN. 17 MULLION CYCLES MIN.			1 000 1/1	_¥				$ \rightarrow$	-	
Image: I							< 16 ±1	i i		
$ \frac{\text{MECHANICAL SPECIFICATIONS:}}{\text{TORQUE}} \\ \text{MECHANICAL ANGLE} \\ \text{MECHANICAL ANGLE} \\ \text{MECHANICAL ANGLE} \\ \text{MECHANICAL ANGLE} \\ \text{MEIGHT:} \\ \text{APPROX. 60 g (2.1 oz)} \\ \text{LIFE:} \\ \text{ID MILLION CYCLES MIN.} \\ \text{MELLION CYCLES MIN.} \\ MEL$	DIELECTRIC STRENGTH:	1,000 Vrms @50/60 Hz for 1	MINUTE			18	<u> </u>	I		
MECHANICAL ANGLE:       360*         TORQUE:       150 g-cm (2.1 in-oz)         WEIGHT:       APPROX. 60 g (2.1 oz)         LIFE:       10 MILLION CYCLES MIN.         ENVIRONMENTAL SPECIFICATIONS:       00*C to +120*C         OPERATING TEMPERATURE:       -40*C to +120*C         VIBRATIONS:       15 Gs. 2.000 Hz         SHOCK:       50Gs. 11 mS         IP 54       50Gs. 11 mS         IP 54       FIGURE 2 MOUNTING DIMENSION         FIGURE 2 MOUNTING DIMENSION       FIGURE 3 WIRING DIAGRAM         MILLESS OTHERWISE NOTE:       1123/B         MELESS OTHERWISE 100 mm; : :05.       1120/C         MILLESS OTHERWISE 100 mm; : :05.       1120/C         MILLESS OTHERWISE 100 mm; : :05.       1120/C         MILLESS OTHERWISE 100 mm; : :05.       B-MAC-B29         E       MILLION					1	2->	<ul> <li></li> <li></li> </ul>			
MECHANICAL ANGLE:       360*         TORQUE:       150 g-cm (2.1 in-oz)         WEIGHT:       APPROX. 60 g (2.1 oz)         LIFE:       10 MILLION CYCLES MIN.         ENVIRONMENTAL SPECIFICATIONS:       00*C to +120*C         OPERATING TEMPERATURE:       -40*C to +120*C         VIBRATIONS:       15 Gs. 2.000 Hz         SHOCK:       50Gs. 11 mS         IP 54       50Gs. 11 mS         IP 54       FIGURE 2 MOUNTING DIMENSION         FIGURE 2 MOUNTING DIMENSION       FIGURE 3 WIRING DIAGRAM         MILLESS OTHERWISE NOTE:       1123/B         MELESS OTHERWISE 100 mm; : :05.       1120/C         MILLESS OTHERWISE 100 mm; : :05.       1120/C         MILLESS OTHERWISE 100 mm; : :05.       1120/C         MILLESS OTHERWISE 100 mm; : :05.       B-MAC-B29         E       MILLION						-		1		
TORQUE:       150 g-cm (2.1 in-o2)         WEIGHT:       APPROX. 60 g (2.1 o2)         LIFE:       10 MILLION CYCLES MIN.         ENVIRONMENTAL SPECIFICATIONS:       -40°C to +120°C         VIBRATIONS:       15 Gs, 2,000 Hz         SHOCK:       50Gs, 11 mS         SEALABILITY:       19 54             UNLESS OTHERWIS:       -40°C to +120°C         VIBRATIONS:       15 Gs, 2,000 Hz         SOGS, 11 mS       50Gs, 11 mS         IP 54       FIGURE 2 MOUNTING DIMENSION             UNLESS OTHERWISE       -A0°C HERWISE         NOTE:       100 mm	MECHANICAL SPECIFICATIONS:					<u> </u>	GORE 1 OUTLINE DIMENSION	_		
WEIGHT: APPROX. 60 g (2.1 oz) LIFE: 10 MILLION CYCLES MIN. ENVIRONMENTAL SPECIFICATIONS: OPERATING TEMPERATURE: -40°C to +120°C VIBRATIONS: 55GS, 11 mS SFACK: 55GS, 11 mS SFACK: 55GS, 11 mS SFACK: 10 F34 UNLESS OTHERWISE MILLION CYCLES MIN. POPERATURE: -40°C to +120°C VIBRATIONS: 55GS, 11 mS SFACK: 55GS, 11 mS S	MECHANICAL ANGLE:	360°								
LIFE: 10 MILLION CYCLES MIN. LIFE: 10 MILLION CYCLES MIN. ENVIRONMENTAL SPECIFICATIONS: OPERATING TEMPERATURE: -40°C to + 120°C VIBRATIONS: 15 Gs, 2,000 Hz SHOCK: 50Gs, 11 mS SEALABILITY: B IP 54 UNLESS OTHERWISE MILLION CYCLES MIN. IP 54 IP 54 UNLESS OTHERWISE AGE IN TRION. IP 54 IP 55 IP 54 IP 55 IP 54 IP 55 IP 55	TORQUE:									
ENVIRONMENTAL SPECIFICATIONS: OPERATING TEMPERATURE: -40°C to +120°C VIBRATIONS: 15 Gs, 2,000 Hz SHOCK: 50Gs, 11 mS SEALABILITY: B UNLESS OTHERWIS: AUXIONAL CONTRACTOR DIMENSION FIGURE 2 MOUNTING DIMENSION TUBERATION DWG PANEL CUTOUT FIGURE 3 WIRING DIAGRAM Midori Midori DECOMPONIES 15 SPECIFICATION DWG FOR MODEL CPP-45SB PANEL CUP DATE APROVED DATE SPECIFICATION DWG FOR MODEL CPP-45SB PANEL CUP B-MAC-B29 E	WEIGHT:	APPROX. 60 g (2.1 oz)					ø54 (2.126)			
ENVIRONMENTAL SPECIFICATIONS: OPERATING TEMPERATURE: -40°C to +120°C VIBRATIONS: 15 Gs, 2,000 Hz SHOCK: 50Gs, 11 mS SEALABILITY: IP 54 IP 54 UNLESS OTHERWISE RecorrigeD.dMRNN draft SPECIFICATION DWG ARE IN mm(n): TOLERAACES: NOTE: 4.57 10 mm: 40.22 10 mm:	LIFE:	10 MILLION CYCLES MIN	l.		1			ි අ	് എ	
ENVIRONMENTAL SPECIFICATIONS: OPERATING TEMPERATURE: -00°C to +120°C VIBRATIONS: 15 Gs, 2,000 Hz SHOCK: 50Gs, 11 mS SEALABILITY: UNLESS OTHERWIS: IP 54 UNLESS OTHERWIS: ARE IN mm(n), TOLERARCE: 10 mm: -0.2 10 mm: -0				ର୍			$\times$ >	4 I	$\mathcal{P}$	
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INLESS OTHERWISE       FIGURE 2 MOUNTING DIMENSION       FIGURE 3 WIRING DIAGRAM         INNESS OTHERWISE       PRAWN       DATE       SPECIFICATION DWG         SPECIFIED, DIMENSION       ARE IN mm(in).       DATE       SPECIFICATION DWG       Midori         ARE IN mm(in).       TOLERANCES:       APPROVED       DATE       MODEL CPP-45SB       Midori         ANGLES       ±1.5°       4PPROVED       DATE       MODEL CPP-45SB       B-MAC-B29       E         100 mm:       ±0.5       2100 mm:       totat       Image: tota				1	1			Zhr.	M	
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(10 mm: ±0.25 < APPROVED     (SEALED)     (SEALED)     (B-MAC-B29 E)     (10 mm: +100							POTENTIOMETER			
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# Potentiometer Sensoren





# Green Pot – Leitplastik Potentiometer

Weitverbreitet sind Cermetpotentiometer deren Widerstandselement aus einem metallbeschichteten Keramikträger besteht oder Drahtpotentiometer. Beide Typen sind jedoch in Servosystemen mit grossen Anforderungen an die Lebensdauer (bis 100 Mio Zyklen und mehr) nicht geeignet. Die Cermetbeschichteten Elemente sind zu hart und der aufgebrachte Metallfilm ist zu dünn.

Die Plastikfilm Potentiometer hingegen erfüllen weitgehend diese Anforderungen, MIDORI begann bereits 1969 als erster Hersteller auf diesem Gebiet mit der Fabrikation von Leitplastik-Potentiometern. Basierend auf den langjährigen Know-how im Bau von Präzisions Potentiometern (seit 1952) entstand die GREEN-POT-Serie. Die im Heisspressverfahren, aus Kohle und Graphitpulver, hergestellten Widerstandselemente garantieren höchste Lebensdauer, Linearität und kleinstes Rauschen. Inzwischen wurde die Greenpot-Serie zum Inbegriff für ein Qualitätsprodukt.

#### Eigenschaften:

Tree Pr

- Unendliche Auflösung besser als 0,3 µm
- grosse Lebensdauer bis über 100 Mio Umdrehungen nach MIL R 39023
- sehr hohe Verstellergeschwindigkeit bis 50Hz
- grosse Genauigkeit (Linearität oder Gleichförmigkeit bis ± 0,05%) lieferbar
- sehr gute Glätte der Ausgangsspannung ≤0,1% über eine lange Betriebszeit
- sehr kleines Rauschen
- langzeitstabil mit Mehrfachfingerkontakten
- grosse Zuverlässigkeit unter schwierigen Umwelteinflüssen
- extrem stabiles Drehmoment und Reibung mit spiegelähnlicher Gleitfläche
- sehr gutes Hochgeschwindigkeitsverhalten über 1000 U/min.
- Betrieb mit 20Hz und mit Hochgeschwindigkeitsschleifer bis 50Hz möglich

#### Aufbau:

Greenpot's Widerstandsschicht und deren Anschlüsse sind in einem Verbund auf einen Träger gesintert respektive zu einem molekularen Verbund verpresst. Die Einheit ist daher sehr robust und deren Stabilität ist immer gewährt.



- lineare Widerstandselemente
- hermetisch dichte Potentiometer
- Seillängengeber

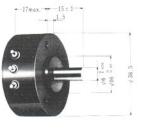
#### Eingang Potentiometer Single Turn Type

### 5 2 05 \$19.



**CP-2FK** 

CP-2FB



CP-3F

Dimensionen in mm



**CP-3FB** 

## **SPEZIFIKATIONEN**

Daten		CP-2F*	CP-3F	CP-3FB	CPP-35B	CPP-45B	CPP-60
Widerstandsbereiche ( $\Omega$ )		500Ω 1k 2k 5k 10k	500Ω 1k 2k 5k 10k	500Ω 1k 2k 5k 10k	500Ω 1k 2k 5k 10k	500Ω 1k 2k 5k 10k 20k	1k 2k 5k 10k 20k
Toleranz	Standard	±20%	±20%	±20%	±20%	±15%	±15%
Auf Wunsch lieferbar		±15%	±10%	±10%	±10%	±10%	±10%
Unabhängige Linearität	Standard	±1%	1%	±1%	±1%	±0.5%	±0.05%
Auf Wunsch lieferbar		±0.2%	±0.2%	±0.2%	±0.1%	±0.1%	±0.025%
Elektr. Drehwinkel	(max.)	$340^{\circ}$	340° +2° - 3°	$340^{\circ}$	340° <sup>1</sup>	$350^{\circ}$	$355^{\circ}$
Leistung	(max.)	1W/70°C	1.5W/70°C	1.5W/70°C	2W/70°C	3W/70°C	$4W/70^{\circ}C$
Isolationswiderstand			> '	100M $\Omega$ bei 50	0VDC (60 se	ec.)	
Prüfspannung		1000 V rms bei normalen atmosphärischen Bedingungen					
Glätte der Ausgangsspann	nung	≤0.1%					
Temp. Koeffizient			≤ 400ppm/°C (~ 200ppm/°C 0°−120°C)				
Mechan. Drehwinkel		$360^{\circ}$	$360^{\circ}$	$360^{\circ}$	360°	360°	360°
Drehmoment	(max.)	20pcm	15pcm	15pcm	14pcm	18pcm	24pcm
Gewicht	(max.)	20g	40g	40g	40g	60g	140g
, Befestigungsart		Servo & Zentral	Servo & Schrauben	Zentral Befestigung	Servo & Schrauben	Servo & Schrauben	Servo
Lager		Sinter & Kugellager	Kugellager	Sinter & Kugellager	Kugellager	Kugellager	Kugellager
Anz.Widerstandselement	e (max.)	-		1000	6	8	2
Zusätzliche Abgriffe	(max.)	1	1	1	6	16	20
Betriebstemperatur-Bere	ich			-25°C ∽	~ +125°C		

\*Neu! CP-2FCK (m), CP-2FCB (m) mit 3-pol. Miniatursteckverbindung, Einbautiefe 16 mm inkl. Stecker.





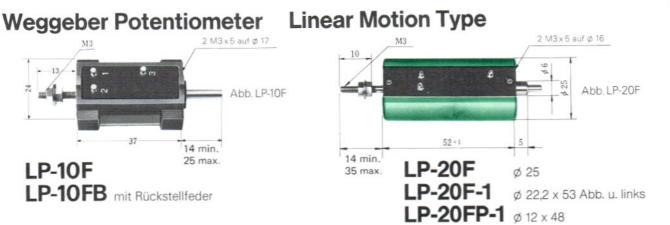


<sup>1</sup> 350° auf Anfrage



CPP-45E Flansch *φ* 1,875'' = 47,63mm

## Green Bt **Conductive Plastic Potentiometer**



## SPEZIFIKATIONEN

M3

R

-13

**LP-10F** 

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-37

LP-10FB mit Rückstellfeder

Daten		LP-10F <sup>1)</sup>	LP-20F	LP-50F	LP-100F	LP-200F	LP-250F
Widerstandsbereiche ( $\Omega$	)	100Ω 200Ω 500Ω 1k*	200Ω 500Ω 1k* 2k	200Ω 500Ω 1k* 2k 5k*	500Ω 1k* 2k 5k* 10k*	1k* 2k* 5k* 10k* 20k	1k 2k 5k* 10k* 20k 30
Elektr. Hub		10mm	20mm	50mm	100mm	200mm	250mm
Toleranz	Standard	±20%	±20%	±20%	±20%	±20%	±20%
Auf Wunsch lieferbar		±10%	±10%	±10%	±10%	±10%	±10%
Unabhängige Linearität	Standard	±1%	±1%	±1%	±0.3%	±0.3%	±0.3%
Auf Wunsch lieferbar		±0.5%	±0.5%	±0.1%	±0.1%	±0.1%	±0.1%
Leistung	(max.)	0.3W/70°C	0.6W/70°C	1.5W/70°C	2.5W/70°C	$4W/70^{\circ}C$	4W/70°C
Isolationswiderstand			>	100M $\Omega$ bei 10	000VDC (60	sec.)	
Prüfspannung			500 V rn	ns bei normalen	atmosphärischen	Bedingungen	
Glätte der Ausgangsspar	nung			≪0	,1%		
Mechan. Hub		12mm	21mm	55mm	103mm	203mm	253mm
Mechan. Spiel		_		_	-	—	-
Reibung	(max.)	30p	30p	50p	100p	100p	100p
Gewicht		60g	45g	75g	300g	400g	500g
Betriebstemperatur-Ber	eich			-25°C ~	~ +125°C		





# Conductive Plastic Potentiometer

#### **CPP-45 mit Reduktionsgetriebe**

Diese Einheit besteht aus dem Potentiometer CPP-45 und einem spielfreien Schneckengetriebe. Die Kombination ist sehr robust und für den Einsatz unter erschwerten Bedingungen geeignet. Die Reproduzierbarkeit des Ausgangs auf die 6Ø Eingangsachse ist kleiner als 0,06%. Die Lebensdauer ist grösser 250 Mio Hochläufe 0...3600 U/Minute.

lyp	Untersetzung	
CPP-45-10S	10:1	Spezifikationen des Po-
CPP-45-24S	24:1	tentiometers CCP-45
CPP-45-35S	35:1	siehe Seite 3.
CPP-45-60S	60:1	Abmessungen
CPP-45-100S	100:1	61 x 50 x ca. 40 mm.

#### CP-2F-..S-RB mit Reduktionsgetriebe

CP-2F- 5S RB 5:1 CP-2F-10S RB 10:1 CP-2F-25S RB 25:1 CP-2F-50S RB 50:1 Lochdistanz M3 auf 16 x 28 mm Einbautiefe 30 mm Achse Ø 6 x 16 CPP-35-3S Untersetzung 3:1 CPP-35-5S Untersetzung 5:1

#### Druckpotentiometer

Diese Potentiometer sind für den Einsatz in erschwerter Umgebung geeignet. Ein Plastikfilmwiderstandselement von grosser Lebensdauer und Zuverlässigkeit überträgt indirekt die Druckveränderung.

Тур	PP-7F	PP-16F
Druckbereiche	0 bis 350 bar	0∼− 760mmHg bis 0∼5 bar
Widerstands- bereich	100Ω bis 2kΩ ± 20%	100Ω bis 1kΩ ± 20%
Genauigkeit inkl. Hysterese	± 1,5%	± 1.5%
Leistung	0,2W/70°C	0,2W/70°C
Überdruck	20%	20%
Gewicht '	600g max.	800g max.
Sensor Prinzip	Bourdonrohr	Blasebalg

#### Motor Potentiometer

Diese Potentiometer beinhalten den DC-Motor, Getriebe und Rutschkupplung. Weitere Ausführungen auf Anfrage.

Тур	SSP-35F	SSP-45F
ausgebauter Pot	CPP-35	CPP-45

DC-Motor Spezifikation (Standard)

Spannung	6V max.
Drehzahl unbelastet	12 000 U/min.
Getriebeuntersetzung	1:76, 1:141, 1:485

Weitere Untersetzungen und Motordaten siehe Datenblatt von MINI-MOTOR S.A., Agno.

#### Fader-Potentiometer Serie MFP-1000

ein oder zwei Kanäle für professionelle Tonstudios  $600\Omega$ , 5 k $\Omega$ , 10 k $\Omega$  linear und logarithmisch, Abmessungen 148 x 47 x 18,5 mm.











# **Conductive Plastic Potentiometer**

Diese Modelle sind äusserst robust (heavy-duty) und unter extremen Bedingungen wie Industrie-Robotern, Kranbau, Schwerindustrie, Traktion etc. einsetzbar. Sonderausführungen auf Anfrage.

#### CPP-45-RBN

Green Pet

Ein robustes, hermetisch dichtes Gehäuse schützt das Potentiometer CPP-45 gegen Schmutz, Öl und Spritzwasser.

Flanschdurchmesser max. 87 mm.

Achse  $\phi$  6 mm.

Potentiometer-Spezifikation siehe S. 5. Ausführung mit Steckerabgang radialist ebenfalls lieferbar.

#### CPP-45-10S-RB

Diese Einheit beinhaltet das Getriebepotentiometer CPP-45-10S (S. 5). Weitere Untersetzungen auf Anfrage. Das dichte Potentiometer ist für den Betrieb unter erschwerten Bedingungen geeignet.

Achse  $\phi$  8 x 20 mm. Abmessungen ca. 100 x 110 x 70 mm.

#### LP-RB-Serie/LP- . . FZ-SW 5

Die Weggeberpotentiometer Serie LP-RB sind hermetisch dicht, sehr robust und unempfindlich gegen Schmutz, Öl und Spritzwasser. (LP-FZ Vibrationsunempfindlich)

LP- 10F-RB	Hub 10mm	LP-100FZ-SW 5	Hub 100 mm	
LP- 50F-RB	Hub 50 mm	LP-150FZ-SW 5	Hub 150 mm	
LP-100F-RB	Hub 100 mm	LP-200FZ-SW 5	Hub 200 mm	
LP-150F-RB	Hub 150 mm	LP-250FZ-SW 5	Hub 250 mm	
LP-200F-RB	Hub 200 mm	LP-300FZ-SW 5	Hub 300 mm	

#### SEILTROMMEL-POTENTIOMETER für grosse Auszugslängen

CPP-45-50LS, -150LS, -220LSCPP-45-20L, -70L, -100LAuszugslängen600, 1600, 2300 mm200, 700, 1000 mmAbmessungen L x B x H100 x 60 x 60 mm130 x 98 x 95 mm ca.Robuste Konstruktion für erschwerte Umweltbedingungenzulässige Beschleunigung 4 m/sec² (Modelle bis 10 m)

#### LP-...FP/LP-...FQ

Die Serie LP-...-FP beinhaltet Weggeber mit 12 mm ¢ und die Serie LP-...-FQ solche mit nur 8 mm ¢ LP-20FP-SW5\* Hub 20 mm LP-20-FQSW5 LP-30FP-SW5 Hub 30 mm LP-30-FQSW5\* LP-50FP-SW5\* Hub 50 mm LP-40-FQSW5

\*Vorzugstypen, weitere Längen auf Anfrage

#### LP-FX-Serie

Robuster Verwindungsfestergeber, spritzwasserdicht, mit wasserdichtem Stecker, Hub von 50 mm bis 750 mm

LP- 50FX-SW5	LP-300F
LP-100FX-SW5	LP-375F
LP-150FX-SW5	LP-500F
LP-200FX-SW5	LP-750F

.P-300FX-SW5 .P-375FX-SW5 .P-500FX-SW5 .P-750FX-SW5

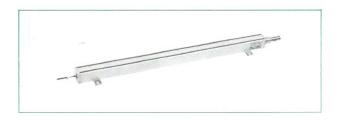












Dieser Katalog zeigt nur Standard Green Bt. Unsere besondere Stärke ist die Fertigung von an Ihre Konstruktion angepassten Potentiometern. Bereits kleine Stückzahlen werden zu günstigem Preis bei normalen Lieferzeiten gefertigt. Unterbreiten Sie uns Ihre Wünsche.

Verlangen Sie den Katalog über die kontaktlosen Potentiometer der Serie  $\beta_{\text{restance}} - \beta_{t}$