MACHINE SPECIFICATIONS
(SELECTION SHEET)

NHC 4000

HORIZONTAL MACHINING CENTER

Draft	Correction		Approval
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Confirmed by Control Technology Team
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DN SOLUTIONS CO., LTD.

HORIZONTAL MACHINING CENTER

NHC 4000

MACHINE SPEC. SELECTION SHEET

DN SOLUTIONS

1. GENERAL SPECIFICATION

ITEM			UNIT	SPECIFICATION			SELECTION	
CAPACITY	PALLET SIZE		mm	400X400			DEFAULT	
	MAX. WORKPIECE SIZE	DIAMETER	mm	600				
		HEIGHT	mm	800				
	MAX. WORKPIECE WEIGHT		kg	400				
	SPINDLE NOSE TO TABLE CENTER		mm	150 ~ 715				
	SPINDLE CENTER TO PALLET TOP		mm	50 ~ 610				
MAIN DIMENSION		LENGTH	mm	4630				
		WIDTH	mm	2260				
		HEIGHT	mm	2830				
MACHINE WEIGHT(NET)(1)			kg	11000				
UTILITY	POWER SOURCE(2)			3Ph-AC200~480V 50/60Hz			DEFAULT	
	REQUIRED POWER CAPACITY (3)		kVA	65.52(3-1)	65.52(3-2)	65.52(3-3)		
	COMPRESSED AIR	PRESSURE	Mpa	0.54				
		CONSUMPTION	NL/min	450				
MACHINE COLOR				DN SOLUTIONS 4 TONE COLOR MT DARK GRAY(5.3PB 3.0 / 0.4) MT MIDDLE GRAY(1.4RP 4.8 / 0.1) MT LIGHT GRAY(7.3B 7.8 / 0.4) MT BLUE(6.1PB 5.9 / 7.6)			STD.	SELECTIVE
				USER DEFINED			OPT.	
CNC CONTROL			MODEL	DN SOLUTIONS-FANUC i (F0i-F PLUS)			STD.	SELECTIVE
				FANUC 32iB PLUS			OPT.	

(1) Specified weight is based on the machine with standard specification and including standard accessories and equipments.

(2) Transformer is required according to supplied power specification.

(3) Depend on spindle motor power

(3-1) Spindle type1 (3-2) Spindle type2 (3-3) Spindle type3

2. SPINDLE HEAD

ITEM			UNIT	SPECIFICATION	SELECTION	
SPINDLE	TYPE1	POWER (CONT./SHORT)	kW	11/18.5(15min)	STD.	SELECTIVE
		MAX. SPINDLE SPEED	r/min	8000		
		BASIC SPEED	r/min	500		
		MAX. TORQUE (SHORT TERM)	N·m	353.4(5min)		
	TYPE2	POWER (CONT./SHORT)	kW	11/18.5(25% ED)	OPT.	
		MAX. SPINDLE SPEED	r/min	12000		
		BASIC SPEED	r/min	1350		
		MAX. TORQUE (SHORT TERM)	N·m	117(25% ED)		
	TYPE3	POWER (CONT./SHORT)	kW	11(CONT.)/18.5(S3 15%)	OPT.	
		MAX. SPINDLE SPEED	r/min	15000		
		BASIC SPEED	r/min	1500		
		MAX. TORQUE (SHORT TERM)	N·m	117.8(S3 15%)		
SPINDLE TOOL CLAMPING FORCE			kN	9.8(15.7)(1)	DEFAULT	
TAPER TYPE				ISO #40, 7/24 TAPER		
SPINDLE COOLING	TANK CAPACITY		L	15		
	CAPACITY		Kcal/h	1029(60Hz)/857(50Hz)		

(1) In case of HSK spindle, tool clampling force is 15.7kN

3. TABLE

ITEM			UNIT	SPECIFICATION	SELECTION	
1˚INDEX	POSITIONING ACCURACY		deg.	7"	STD.	SELECTIVE
	REPEATABILITY ACCURACY		deg.	4"		
	MAX. ROTATING SPEED		r/min	25		
	TABLE INDEXING TIME	90˚	s	1.9		
		180˚	s	2.5		
		360˚	s	3.7		
	CLAMPING FORCE(1)		kN	63		
0.001˚ ROTARY	POSITIONING ACCURACY		deg.	9"	OPT.	SELECTIVE
	REPEATABILITY ACCURACY		deg.	5"		
	MAX. ROTATING SPEED		r/min	20		
	CLAMPING TORQUE		N·m	6085		
WORK INERTIA (2)			$N.m^2$	108	DEFAULT	

(1) According to cutting place of workpiece(height direction) max. cutting capacity can be different.

(2) When the specified workpiece inertia value is exceeded, an M-code command shall be configured based on the maximum workpiece weight forthe Work Load Control function. function.

(3) Accuracy measuring is based on ISO230-2.

4. AXES SYSTEM

ITEM			UNIT	SPECIFICATION	SELECTION
STROKE		X AXIS	mm	600	DEFAULT
		Y AXIS	mm	560	
		Z AXIS	mm	565	
RAPID TRAVERSE		X AXIS	m/min	48	
		Y AXIS	m/min	40	
		Z AXIS	m/min	48	
ACCELERATION / DECELERATION TIME		X AXIS	msec	220	
		Y AXIS	msec	220	
		Z AXIS	msec	220	
MAX. CUTTING FEEDRATE			mm/min	20000	
RATED THRUST FORCE AT STALL		Z AXIS	kN	8.6	
BALL SCREW(DIAMETER x LEAD)		X AXIS	mm	40X16	
		Y AXIS	mm	40X16	
		Z AXIS	mm	40X16	
ACCURACY	POSITIONING / REPEATABILITY (2)	X AXIS	mm	0.008 / 0.005	
		Y AXIS	mm	0.008 / 0.005	
		Z AXIS	mm	0.008 / 0.005	
DRIVE MOTOR POWER (STALL TORQUE)(1)	X AXIS		kW	4.0	DEFAULT
	Y AXIS		kW	4.0	
	Z AXIS		kW	4.0	
	B AXIS	INDEX	kW	1.6	
		ROTARY	kW	3.0	
FEEDBACK SYSTEM	ABSOLUTE PULSE CODER			X,Y,Z,B	DEFAULT

(1) This value is based on fanuc servo motor.
(2) Accuracy measuring is based on ISO230-2.

5. ATC

ITEM		UNIT	SPECIFICATION		SELECTION	
TOOL SHANK	PULL STUD		MAS403 BT 40	PS806(NIKKEN)	STD.	SELECTIVE
			CAT 40	MODIFIED DIN	OPT.	
			DIN 69871-A40	DIN 69872 #40	OPT.	
			ISO 12164-1HSK-A63	-	OPT.	
TOOL STORAGE CAPACITY		ea	40		STD.	SELECTIVE
		ea	60		OPT.	
		ea	80		OPT.	
		ea	120 (60+60 MAG.)		OPT.	
		ea	170 (MATRIX)		OPT.	
		ea	262 (MATRIX)		OPT.	
TOOL SELECT TYPE			FIXED ADDRESS		DEFAULT	
MAX. TOOL DIAMETER		mm	75(CONT.), 140(ADJACENT POTS EMPTY)(1)			
MAX. TOOL LENGTH		mm	300			
MAX. TOOL WEIGHT		kg	10			
MAX. TOOL MOMENT		N·m	11.8			
T-T-T TIME		s	LESS THAN 7.5kg : 1.5 , MORE THAN 7.5kg : 2.0			
C-T-C TIME		s	LESS THAN 7.5kg : 4.0 , MORE THAN 7.5kgf : 4.5			

(1) In case of matrix magazine, max. tool diameter is different on each tool pot. (Ø75 ~ Ø140)

6. APC & PALLET POOL SYSTEM

ITEM			UNIT	SPECIFICATION		SELECTION	
PALLET SURFACE	TAP PALLET			24-M16xP2.0		STD.	SELECTIVE
	T-SLOT PALLET			4-18H8		OPT.	
PALLET ROTATION IN SETUP STATION				MANUALLY 90˚		DEFAULT	
TWIN PALLET	NUMBER OF PALLET		ea	2			
	MIN. PALLET CHANGE TIME		s	8			
	MAX. WORKPIECE SIZE		mm	Φ600 x 800h			
	MAX. WORKPIECE WEIGHT		kg	400			
	PALLET CHANGE TYPE			ROTARY SHUTTLES			
DN ROUND STORAGE	NUMBER OF PALLET		ea	6		OPT.	SELECTIVE
	MAX. WORKPIECE SIZE		mm	Φ600 x 800h			
	MAX. WORKPIECE WEIGHT		kg	400			
	MAGAZINE TYPE			BUFFER STATION TYPE with CARRIER			
	OPERATION			SCHEDULED OPERATION(BUILT-IN CONTROL)			
	DRIVING MECHANISM	ROTATING AXIS		SERVO MOTOR & REDUCTION GEAR			
		FORKING AXIS		HYDRAULIC CYIINDER & RACK / PINION			
DN ROUND STORAGE	NUMBER OF PALLET		ea	14	21	OPT.	
	MAX. WORKPIECE SIZE		mm	Φ600 x 800h	Φ600 x 700h		
	MAX. WORKPIECE WEIGHT		kg	400			
	MAGAZINE TYPE			BUFFER STATION TYPE with CARRIER			
	OPERATION			SCHEDULED OPERATION(BUILT-IN CONTROL)			
	DRIVING MECHANISM	ROTATING AXIS		SERVO MOTOR & REDUCTION GEAR			
		LIFTING AXIS		SERVO MOTOR & BALL SCREW			
		FORKING AXIS		HYDRAULIC CYIINDER & RACK / PINION			
LPS (LINEAR PALLET SYSTEM) *(NOTE.3)	NUMBER OF PALLET		ea	12 ~ 72		OPT.	
	MAX. WORKPIECE SIZE		mm	Φ600 x 800h			
	MAX. WORKPIECE WEIGHT		kg	400			
	MAGAZINE TYPE			BUFFER STATION TYPE with STACKER CRANE			
	OPERATION			SCHEDULED OPERATION			
	PALLET DRIVE DEVICE			SERVO MOTOR & REDUCTION GEAR			

7. LUBRICATION & HYDRAULIC SYSTEM

ITEM		UNIT	SPECIFICATION	SELECTION
LUBRICATION	TANK CAPACITY	L	1.4	DEFAULT
	PUMP MOTOR POWER	kW	0.057	
	DISCHARGE PRESSURE	MPa	1.73	
	DISCHARGE VOLUME	L/min	0.15	
	DISTRIBUTOR TYPE		METERING	
HYDRAULIC SYSTEM	TANK CAPACITY	L	43	DEFAULT
	MOTOR CAPACITY	kW	2.2	
	OPERATING PRESSURE	MPa	5.5	
	FLOWRATE	L/min	25	

8. COOLANT SYSTEM

ITEM		UNIT	SPECIFICATION	SELECTION	
FLOOD COOLANT	TANK CAPACITY	L	550 (STD. TANK COMMON)	DEFAULT	
	PUMP MOTOR POWER	kW	1.1		
	FILTERATION	mesh	10(TANK SCREEN FILTER)		
	MAX. PRESSURE 60Hz(50Hz)	MPa	0.7(0.47)		
	MAX. FLOWRATE	L/min	30		
	PUMP TYPE		IMMERSION TYPE		
THROUGH SPINDLE COOLANT - MIDDLE PRESSURE TSC I	TANK CAPACITY	L	STD. TANK COMMON	OPT.	SELECTIVE
	PUMP MOTOR POWER	kW	1.5		
	FILTERATION	㎛	25(CYCLONE TYPE)[1]		
	MAX. PRESSURE 60Hz(50Hz)	MPa	2.0(1.9)[2]		
	MAX. FLOWRATE 60Hz(50Hz)	L/min	23[3](18)[4]		
	PUMP TYPE		T-ROTOR TYPE		
THROUGH SPINDLE COOLANT - MIDDLE PRESSURE TSC II	TANK CAPACITY	L	140	OPT.	
	PUMP MOTOR POWER	kW	2.9		
	FILTERATION	㎛	25(CYCLONE TYPE)[1]		
	MAX. PRESSURE 60Hz(50Hz)	MPa	3.0(3.0)[2]		
	MAX. FLOWRATE 60Hz(50Hz)	L/min	36[5](31)[6]		
THROUGH SPINDLE COOLANT - HIGH PRESSURE TSC I	TANK CAPACITY	L	140	OPT.	SELECTIVE
	PUMP MOTOR POWER	kW	7.5		
	FILTERATION	㎛	25(CYCLONE TYPE)[1]		
	MAX. PRESSURE 60Hz(50Hz)	MPa	7.0[2]		
	MAX. FLOWRATE 60Hz(50Hz)	L/min	39[7](32)[8]		
TSC PREPERATION[9]			WITH OUT PUMP & FILTER	OPT.	

SHOWER COOLANT	TANK CAPACITY	L	STD. TANK COMMON	OPT.	SELECTIVE
	PUMP MOTOR POWER	kW	1.8		
	FILTERATION	mesh	10(TANK SCREEN FILTER)		
	MAX. PRESSURE 60Hz(50Hz)	MPa	0.2(0.15)		
	MAX. FLOWRATE	L/min	260		
	PUMP TYPE		IMMERSION TYPE		
COOLANT GUN(10)	TANK CAPACITY	L	STD. TANK COMMON	OPT.	SELECTIVE
	PUMP MOTOR POWER	kW	0.6		
	FILTERATION	mesh	10(TANK SCREEN FILTER)		
	MAX. PRESSURE 60Hz(50Hz)	MPa	0.2(0.15)		
	MAX. FLOWRATE 60Hz(50Hz)	L/min	70(55)		
	PUMP TYPE		IMMERSION TYPE		
OIL SKIMMER	TYPE		BELT	OPT.	SELECTIVE

(1) If high viscosity neat oil is using for coolant, spindle can be damaged by contamination due to decrease of filtering efficiency.
(For more information, consult with DN Solutions R&D)
(2) This value is the max. pressure when blocking.
(3) This value is the coolant flow rate when tool hole dia. is 6mm and pump outlet pressure is 0.8 MPa.
(4) This value is the coolant flow rate when tool hole dia. is 6mm and pump outlet pressure is 0.6 MPa.
(5) This value is the coolant flow rate when tool hole dia. is 6mm and pump outlet pressure is 1.4 MPa.
(6) This value is the coolant flow rate when tool hole dia. is 6mm and pump outlet pressure is 1.0 MPa.
(7) This value is the coolant flow rate when tool hole dia. is 5 mm and pump outlet pressure is 1.8 MPa.
(8) This value is the coolant flow rate when tool hole dia. is 5 mm and pump outlet pressure is 1.1 MPa.
(9) There are coolant piping inside of the machine & rotating union on the spindle head for tsc ready.
(10) This device is opearated by APC set-up door
<NOTE>
At (3)~(6), real pressure and flow rate can be changed by machine & tool condition.
For more information, consult with DN Solutions R&D.

9. CHIP CONVEYOR & BUCKET

ITEM			UNIT	SPECIFICATION	SELECTION	
CONVEYOR	DIRECTION	SIDE TYPE	SET		STD.	SELECTIVE
		REAR TYPE	SET		OPT.	
	HINGED PLATE TYPE CONVEYOR		SET		OPT.	SELECTIVE
	MAGNETIC SCRAPER TYPE CONVEYOR		SET		OPT.	
	2 STEP DRUM CHIP CONVEYOR		SET		OPT.	
BUCKET	TYPE	FORKLIFT	SET	DN SOLUTIONS STANDARD TYPE	OPT.	SELECTIVE
		ROTATION	SET	DN SOLUTIONS STANDARD TYPE	OPT.	
	CAPACITY		L	300	OPT.	
			L	380	OPT.	

10. COOLING FOR ELECTRIC CABINET

ITEM	UNIT	SPECIFICATION	SELECTION	
AIR CONDITIONER			OPT.	SELECTIVE

11. ACCESSORIES

ITEM			UNIT	SPECIFICATION	SELECTION	
STANDARD	WORK LIGHT		SET	LED LAMP	DEFAULT	
	OPERATOR CALL LAMP		SET	3-COLOR SIGNAL TOWER (LED)		
	LEVELING BLOCK & BOLT		SET	TRIANGLE-BOLT & GROUTING		
	INSTALLATION TOOL KIT		SET			
OPTIONAL	AUTO TOOL LENGTH MEASUREMEMT	MAKER/SPEC.	SET	RENISHAW/TS27R(1)	OPT.	SELECTIVE
		MAKER/SPEC.	SET	RENISHAW/RMI-Q(1)	OPT.	
	AUTO TOOL BREAKAGE DETECTION	MAKER/SPEC.	SET	OMRON/D5A(1)	OPT.	
		MAKER/SPEC.	SET	FAR-EAST MACHINE TOOL/FEM-1CP (NEELDE TYPE IN CUTTING AREA)	OPT.	
		MAKER/SPEC.	SET	MSC/BK9(NEELDE TYPE ON MAGAZINE)	OPT.	
		MAKER/SPEC.	SET	RENISHAW/TRS2	OPT.	
		MAKER/SPEC.	SET	RENISHAW/NC4(2)	OPT.	
	AUTO WORKPIECE MEASUREMENT	MAKER/SPEC.	SET	RENISHAW/OMP60	OPT.	SELECTIVE
		MAKER/SPEC.	SET	RENISHAW/RMP60	OPT.	SELECTIVE
	MAINTENANCE TOOL KIT		SET	L-WRENCH AND SPANNER SET	OPT.	SELECTIVE
5TH AXIS PREPARATION(2)			SET	USER DEFINED	OPT.	SELECTIVE
AIR GUN			SET		OPT.	SELECTIVE
COOLANT CHILLER (3)			SET		OPT.	SELECTIVE

(1) This device is up & down moving type.

(2) Please inquire DN Solutions R&D department when end-user select

(3) In case of using neat cutting oil, this device is highly recommended in order to reduce the change of accuracy by rising the coolant temperature

12. SPECIAL QUOTATION OPTIONS

ITEM		UNIT	SPECIFICATION	SELECTION	
TOOL ID (1) (INTERNAL-MATRIX)		SET	BALLUFF SENSOR	OPT.	SELECTIVE
TOOL MANAGEMENT (TMT1, TMT2, TMT8 DIGIT) (1)		SET		OPT.	SELECTIVE
BALL SCREW SHAFT COOLING		SET	X/Y/Z AXIS	OPT.	SELECTIVE
SETUP SHOWER COOLANT		SET		OPT.	SELECTIVE
AUTO DOOR W/SAFETY EDGE		SET		OPT.	SELECTIVE
U-AXIS DRIVE		SET	DANDREA	OPT.	SELECTIVE
MQL		SET	MAKER:VOGEL	OPT.	SELECTIVE
SPINDLE SMART THERMAL CONTROL		SET	SENSOR TYPE	OPT.	SELECTIVE
STRUCTURE SMART THERMAL CONTROL		SET	SENSOR TYPE	OPT.	SELECTIVE
TSA	MAX. PRUSSURE	MPa	0.54	OPT.	SELECTIVE
SPIN WINDOW FOR MAIN DOOR (ELECTRIC TYPE)		SET	MAKER:T2K	OPT.	SELECTIVE
COOLANT TANK_LEVEL S/W		SET	IFM	OPT.	SELECTIVE

(1) Please inquire DN Solutions R&D department when end-user select

< NOTE >

1. Specifications are subject to change without prior notice.
2. All specified values are given at standard electric power conditions.(60Hz, 220V)
3. Please inquire DN Solutions R&D department when end-user select * marks necessarily
4. Machine lay-out and weight are changed according to optional specification.
5. Please refer to lay-out and foundation drawing in relation to installation/electric device.
6. All specified values of pressure and flow rate of coolant and hydraulic pump are given at pump outlet.
7. The flowrate and the pressure of coolant are given at the condition of using water soluble coolant.
8. Since pressure and flowrate of T-S-C have influence on tool life and cutting capability, type of T-S-C should be selected with prudence. for detail specification about T-S-C , refer to chapter Ⅱ-12-B of machining center sales guides.
9. Refer to the separated spec. sheets in relation to specification, function and option of CNC controller.